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July 16, 1987

WRITER'S DIRECT DIAL NUMBER

(216) 566-5815

Ms. Susan Swales  
CERCLA Enforcement 5HE-12  
U. S. Environmental Protection Agency  
230 South Dearborn Street  
Chicago, IL 60604

Re: Fields Brook Superfund Site; Gulf  
& Western CERCLA § 104(e)  
Request for Information

Dear Ms. Swales:

Enclosed please find the Response of Gulf & Western Industries, Inc. (now known as Gulf & Western Inc.) ("G+W") to the U.S. EPA's Request for Information pursuant to § 104(e) of CERCLA, and § 3007 of RCRA.

As you are aware pursuant to my letter of February 18, 1987, response to the request has been hampered by the unavailability of most of the relevant documents. G+W was finally able to obtain from SCM Corp. copies of relevant documents as previously submitted to the EPA by SCM, and you will note that the Preliminary Statement of G+W reflects the fact that the enclosed response was almost entirely dependant on those documents; in fact, only a portion of the documents which SCM submitted to the EPA were in turn provided to G+W. Where a diligent search of the G+W archives yielded additional responsive documents, G+W has submitted them herewith, as exhibits to the response.

We regret the necessary delay in responding to the EPA's request for information. Please contact me if you have any questions.

Yours truly,

*Michael A. Cyphert*  
Michael A. Cyphert

MAC:dlm

Enclosure(s)

cc: Elisa M. Rivlin, Esq. (w/enclosure)  
Karen E. Rubin, Esq. (w/enclosure)

July 1976

UNITED STATES ENVIRONMENTAL  
PROTECTION AGENCY  
REGION V

In the Matter of:	)	Response of Gulf & Western
	)	Industries, Inc. (now
	)	known as Gulf + Western
FIELDS BROOK	)	Inc.) to U.S. EPA's
ASHTABULA COUNTY, OHIO	)	Request for Information
	)	Pursuant to Section 104
	)	of the Comprehensive
	)	Environmental Response,
	)	Compensation and
	)	Liability Act of 1980, 42
	)	U.S.C. Section 9604, and
	)	Section 3007 of the
	)	Resource Conservation and
	)	Recovery Act, 42 U.S.C.
	)	Section 6927.

PRELIMINARY STATEMENT

Gulf & Western Industries, Inc. (now known as Gulf + Western Inc.) ("G+W") hereby submits its response to the U.S. EPA's Request for Information related to Fields Brook, Ashtabula County, Ohio.

The ability of G+W to respond to the Request is extremely circumscribed by several factors. G+W formerly owned and operated two facilities in the Fields Brook water basin, as described more fully in succeeding responses. As part of the sale of both facilities to SCM Corporation, (Glidden-Durkee Division) ("SCM") as of July 15, 1983, SCM acquired possession of all documents associated with the plants. Only an extremely limited number of documents were

maintained by G+W at its corporate headquarters in New York City subsequent to the sale. The retained documents are primarily confined to those which were generated in connection with the sale of the plants to SCM.

In preparing its Response to this Request for Information, therefore, G+W has had nearly no independent access to original documents or other information in its own possession. Rather, G+W has depended on SCM's narrative Amended Response ("Response") to U.S. EPA's May 16, 1986 Request for Information, which SCM recently provided to G+W at G+W's request. In addition to its Response, SCM provided to G+W (with a few omissions) the same documents which SCM provided to the U.S. EPA in support of its narrative Response.

Thus, in the Responses which G+W makes hereunder, G+W has necessarily relied on information generated and provided by others which is already in the possession of the U.S. EPA. Unless otherwise expressly stated in a response, each response which G+W makes hereunder is subject to the limitations just described.

#### GENERAL OBJECTIONS

G+W respectfully objects to several of the instructions accompanying this Request for Information. Specifically, G+W objects to requests to provide home addresses of individuals where it has supplied business addresses. G+W objects to the instruction requiring it to

provide estimates and indicate the underlying methodology of such estimates where responsive information is not available or accessible. G+W also objects to instructions which require responses based on information in the possession or control of third persons, including retained counsel. In addition, G+W objects to any instruction to the extent it seeks disclosure of communications shielded by the attorney-client or attorney work-product privileges. G+W also objects to instructions calling for continuing or correcting responses based on information acquired after the submission of a complete response to this Request.

#### RESPONSES

1) Please provide the date, State of incorporation, registered agent and his address for the addressed Corporation (hereinafter referred to as TAC).

#### Response:

Gulf and Western Industries (now known as Gulf + Western Inc.) ("G+W") was incorporated under the laws of the state of Delaware on April 18, 1967. Its registered agent is The Prentice-Hall Corp. System, Inc., 229 S. State St., Dover, Delaware 19901.

2) Provide the addresses of all facilities that have ever been owned or operated by TAC in the Fields Brook water basin in, or adjacent to, Ashtabula County, Ohio. If any of the facilities that have been operated by TAC were not at all times of operation owned by TAC, provide

the name(s) of the other owner(s) of the facility and a description of each property's location.

Response:

- a) 2464 Middle Road  
Ashtabula, Ohio 44004  
(Titanium dioxide plant)
- b) 1704 State Road  
Ashtabula, Ohio 44004  
(Titanium tetrachloride plant)

Both plants are now owned and operated by SCM Corporation (Glidden-Durkee Division) ("SCM").

Former owners and/or operators of the titanium dioxide plant are:

New Jersey Zinc Co.  
Jersey Titanium Co.  
Cabot Corp.  
Cabot Titania, Inc.  
Cabot Titania Co.  
Cabot Corp. (2/3)  
Rubberoid Corp. (1/3)

Former owners and/or operators of the titanium tetrachloride plant are:

New Jersey Zinc Co.  
Jersey Titanium Co.  
Cabot Corp.  
Cabot Titania, Inc.  
Cabot Titania Co.  
Cabot Corp. (2/3)  
Rubberoid Corp. (1/3)  
RMI Co.  
U.S. Industrial Chemicals Co.  
National Distillers and Chemical Corp.  
Mallory Sharon  
Stauffer Chemical Co.

3) If any of the property owned by TAC in, or adjacent to, the Fields Brook water basin has been sold,

leased or interests in said property otherwise conveyed by TAC to a third party or by a third party to TAC, state that party's name and the dates of any conveyance or sale.

Response:

G+W sold the assets of both plants to SCM as of July 15, 1983.

4) Provide a legal description of any TAC facilities or property located in, or adjacent to, the Fields Brook water basin in Ashtabula County, Ohio.

Response:

Titanium Dioxide Plant: 2426 Middle Road

Situated in the Township of Ashtabula, County of Ashtabula, State of Ohio and being part of Lots 7 & 8, Erie Tract;

Beginning at a point in the centerline of Middle Rd. at the Easterly R/W Line of the Penn-Central R.R.;

Thence North 89° 27' East, along the centerline of Middle Rd., 5.07 feet to a spike in an angle therein;

Thence North 88° 40' 45" East, along the centerline of Middle Rd., 1127.23 feet to a point in an angle therein;

Thence North 88° 09' 45" East, along the centerline of Middle Rd., 454.46 feet to a point in the westerly line of land now owned by The Cleveland Electric Illuminating Company;

Thence South 18° 27' 30" East, along the westerly line of The Cleveland Electric Illuminating Company, 20.87 feet to an iron pin in the southerly line of Middle Rd.; thence in the same course, 187.80 feet to an iron pin in an angle therein;

Thence South 0° 03' 30" East, along the westerly line of The Cleveland Electric Illuminating Company, 326.00 feet to an iron pin in the northerly R/W line of the Penn-Central R.R.;

Thence Southwesterly along the northerly R/W line of the Penn-Central R.R. by the following courses,

South 69° 09' West, 107.88 feet to an iron pin;

South 0° 05' 30" West, 10.70 feet to an iron pin;

South 69° 09' West, 933.68 feet to an iron pin;

North 20° 51' West, 5.00 feet to an iron pin;

South 69° 09' West, 714.57 feet to an iron pin;

South 0° 30' East, 5.33 feet to an iron pin;

South 69° 09' West, 251.77 feet to a concrete R.R. monument;

Thence northeasterly along a curve in the easterly R/W line of the Penn-Central R.R., having an angle of 46° 41' 20", a radius of 758.28 feet, an arc distance of 617.90 feet, a chord bearing and distance of North 22° 50' 40" East, 595.70 feet to a point in the point of tangent;

Thence North 0° 30' West, along the easterly R/W line of the Penn-Central R.R., 640.36 feet to an iron pin in the southerly line of Middle Rd.; thence in the same course, 20 feet to the place of beginning and containing 31.70 acres of land.

Subject to and together with all easements of record.

Titanium Tetrachloride Plant: 1704 State Road

Situated in the Township of Ashtabula, County of Ashtabula, State of Ohio, and being part of the Holmes Tract;

Beginning at a point in the centerline of State Rd., 115 feet northerly from the centerline of Middle Rd., as measured along the centerline of State Rd.

Thence North 0° 39' West, along the centerline of State Rd., 492.47 feet to an iron pin monument in an angle therein;

Thence North 0° 03' 30" West, along the centerline of State Rd., 298.60 feet to a point in the southwest corner of land now owned by Detrex Chemical Industries, Inc.;

Thence South 87° 23' 30" E. along the southerly line of Detrex Chemical Industries, Inc., 30.03 feet to an iron pin in the easterly line of State Rd.; then in the same course, 1520.22 feet to an iron pin;

Thence South 0° 17' 30" East, 397.85 feet to an iron pin;

Thence South 11° 40' 45" West, 361.47 feet to an iron pin;

Thence South 89° 27' West, parallel with the centerline of Middle Rd., 1401.06 feet to an iron pin;

Thence North 0° 39' West, parallel with the centerline of State Rd., 45 feet to an iron pin;

Then South 89° 27' West, parallel with the centerline of Middle Rd., 40 feet to an iron pin in the easterly line of State Rd.; thence in the same course, 30 feet to the place of beginning and containing 27.829 acres of land.

Subject to and together with all easements of record.

5. Provide copies of any and all documents pertaining to the use and ownership of any TAC facility or property in Ashtabula County, Ohio, including, but not limited to, deeds, contracts, leases, subleases, purchase agreements and related correspondence.

Response:

G+W objects to this Request as beyond the scope of 42 U.S.C. §§ 6927 and 9604. The Request is overly

broad and burdensome. Without waiving this objection, G+W references two documents submitted by SCM in its Response to the EPA's Request for Information. They are the Purchase Agreement between G+W and SCM, numbered by SCM as Document No. 000553 and the Bill of Sale and Assumption of Liabilities, numbered by SCM as Document No. 000609.

6) Please provide the following information on each TAC facility that is within or may have discharged into the Fields Brook basin:

- a) the date of acquisition.
- b) the nature of the acquisition.
- c) the products produced at the facility before and after the acquisition.
- d) TAC position regarding its assumption of liability for actions arising out of operations at the plant by any previous owner/operator.
- e) all documents regarding the acquisition, including, but not limited to, contracts, deeds, leases, subleases, purchase agreements and correspondence.
- f) the plant's address.
- g) the date operations commenced.

Response:

a., b. Both the titanium tetrachloride and titanium dioxide plants were leased from Cabot Corporation and its subsidiary Cabot Titania, Inc. by New Jersey Zinc Co., a division of G+W, commencing on June 1, 1972. In

connection with the Lease, the parties simultaneously entered into an Asset Sale Agreement covering certain inventory, unfilled orders and customer lists. Through exercise of its option to purchase the plants, as contained in its Lease, New Jersey Zinc Co. purchased both plants from Cabot Corp. and Cabot Titania, Inc. under a Bill of Sale dated as of June 1, 1975. Both plants were transferred from New Jersey Zinc Co. to Jersey Titanium Co. by Bill of Sale and Assignment as of January 31, 1979. To the best of G+W's present knowledge, under the Ohio Fictitious Name Act, Jersey Titanium Co. was a fictitious name of G+W, as a foreign corporation licensed to do business in Ohio. The assets of both plants were purchased by SCM as of July 15, 1983.

c. Titanium dioxide and titanium tetrachloride were produced at the plants by Cabot Corp. through its subsidiary Cabot Titania, Inc. prior to their acquisition by G+W, and by G+W through its subsidiaries thereafter.

d. Under Paragraph 13(b)(i) of the Asset Sale Agreement among New Jersey Zinc Co., as buyer and Cabot Corp. and Cabot Titania, Inc., as sellers, the sellers retained all liabilities and obligations for actions arising out of operation of the plants or its activities on the properties prior to June 1, 1972.

e. A copy of the Lease from Cabot Corporation and Cabot Titania, Inc. is attached as Exhibit A.

A copy of the Asset Sale Agreement among New Jersey Zinc Co., Cabot Corp. and Cabot Titania, Inc. is attached as Exhibit B.

A Copy of the Bill of Sale among New Jersey Zinc Co., Cabot Corp. and Cabot Titania, Inc., including limited warranty deeds conveying the premises of both plants to New Jersey Zinc Co., is attached as Exhibit C.

A copy of the Bill of Sale and Assignment by New Jersey Zinc Co. to Jersey Titanium Co. is attached as Exhibit D.

f. See Responses to Nos. 2 and 4.

g. The titanium tetrachloride plant was built by Stauffer Chemical Co., which began operations at the facility in 1956. The titanium dioxide plant was built by Cabot Corp., and began operations in 1963. Both plants have been operated continuously since.

7) Provide a list of all present and former plant managers, production managers and plant engineers at any of the above-described facilities. Please state the dates of their employment with the TAC, positions held and last known address. Also, please indicate the numbered Requests regarding which they may have information.

Response:

PLANT MANAGERS

<u>Name</u>	<u>Dates of Employment</u>	<u>Other Positions Held</u>	<u>Address/Last Known Address</u>
Dr. Thomas H. Goodgame	1/15/63 - 2/22/64		NON RESPONSIVE
Denis E. O'Mulloy	4/1/64 - 3/1/65		
D. Brittain Briggs	3/15/61 - 9/7/65	Assistant Plant Manager	
Edward J. Holland	2/1/65 (7/1/44) - 8/69	Assistant Manager	
Irwin H. Hess	7/19/67 - 6/1/72	Tech. Dir.; VP & Gen. Mgr.; President	
Fred R. Mohrmann	5/8/63 - 7/13/77	Area Supv.; Prod. Mgr.; Prod. Supt.	
Douglas A. Towner	6/20/66 - present	Engr.; Group Leader; Tech. Mgr.-Titania; Prod. Supt.; Mgr.-Sp. Projects	

PRODUCTION MANAGERS  
TITANIUM DIOXIDE PLANT

<u>Name</u>	<u>Dates of Employment</u>	<u>Other Positions Held</u>	<u>Address/Last Known Address</u>
Howard Weaver, Jr.	2/1/63 (12/6/43) - 2/1/72	Prod. Mgr.; Mgr. Proc. Dept.; Proc. Engr. Ch. Class; TiCl4 Mfg. Tech. Serv. Rep. Process Engr., TiCl4 Tech. Serv. Coordinator	NON RESPONSIVE
Albert R. Schell, Jr.	3/1/64 - 9/13/65	Pro. Engr.	
Fred R. Mohrmann	(see other listings)		
Douglas A Towner	(see other listings)		
Ray E. Clark	8/3/64 - present	Shift. Supt.; Prod. Supt.; TiO2 Assist. Area Prod. Supt.	

Assist. Plant  
Supt.

Robert L. Suttman

7/22/68 -  
present

Pro. Eng.; TiO2  
Tech. Liaison;  
Area Prod. Supt.;  
Tech. Coordinator;  
Superv. Chem.  
Engr.; Acting  
TiO2 Superin-  
tendent; Tech.  
Supt.

NON RESPONSIVE

Ray E. Clark

(see other listings)

Robert L. Lambert

10/1/80  
(2/7/61) -  
present

PRODUCTION MANAGERS  
TITANIUM TETRACHLORIDE PLANT

<u>Name</u>	<u>Dates of Employment</u>	<u>Other Positions Held</u>	<u>Address/Last Known Address</u>
Fred R. Mohrmann	(see other listings)		
Michael G. Fowler	7/1/63 (8/29/60) - 4/1/71	Junior Engr.; Prod. Engr.; Area Process Engr.	
Ross A. Palmer	6/3/63 - present	TiO2 Prod. Shift Supv.; TiCl4 Prod. Supr.; Warehouse Foreman; QC/Ware- house/Shipping Foreman	
Lowell W. Johnson	4/1/64 - 7/31/68	TiO2 Prod. Engr.; Process Engr.; Sr. Process Engr.	
Michael G. Fowler	(see other listings)		
Barry G. O'Connell	1/2/68 - 6/30/77	TiCl4 Prod. Engr.	
Alfred C. Steinbronn	12/1/75 (6/26/61) - present	Operations Manager	

Rodney Shimko

9/12/77 -  
present

Chem. Engr. I;  
Sr. Process  
Engineer

NON RESPONSIVE

PLANT ENGINEERS

<u>Name</u>	<u>Dates of Employment</u>	<u>Other Positions Held</u>	<u>Address/Last Known Address</u>
Jack H. Thornton	2/1/63 - 6/30/64		
A. V. Dickey	6/1/65 (12/1/57) - 4/30/66	Maint. Supr.; Maint. Supt.	
John H. Nuber	5/1/63 - 5/6/66	Engr.; Assist. Ch. Engr.	
Donald R. Murray	1/20/64 - 10/23/70	Proj. Engr.; Sr. Proj. Engr.	
Joseph Ramano	3/15/66 - 11/1/70		
John R. Wullschleger	4/20/65 - 2/29/68	M.E.; Gen. Foreman Maint. Supt.	
Paul J. Findlay	1/18/65 - 3/29/74	Engr.; Maint. Supt.	

It is believed that Messrs. Steinbronn, Tyneski and Towner participated in the preparation of this response under the direction of SCM, as described in G+W's Preliminary Statement. As to the other persons named above, G+W objects to identifying the requests as to which they may have information, since this request calls for speculative information which is unreasonably burdensome and which beyond the scope of 42 U.S.C. §§ 6927 and 9604.

8) Provide the names of any predecessor or successor corporations or partnerships which owned or operated any TAC facility, as described above, in Ashtabula County, Ohio.

Response:

See Response No. 6. G+W acquired both plants from Cabot Corp. and Cabot Titania, Inc. The assets of both plants were sold as of July 15, 1983 to SCM, which continues to operate both plants. See also Response No. 2.

9) Provide all knowledge or information you may have regarding contamination from your plant(s) entering Fields Brook, or a tributary thereof, either directly or indirectly.

Response:

At all times during G+W's ownership of the titanium dioxide and titanium tetrachloride plants, NPDES permits were in effect covering waste water discharges into Fields Brook. In addition, prior owners of the plants also held such permits. Routine filings by G+W and the prior owners of the plants made with the EPA, Ohio EPA and their predecessor agencies contain extensive information in describing these discharges. Such information concerning both routine and non-routine discharges is contained in numerous permit applications, permits, self-monitoring reports, compliance inspection reports, effluent guideline sampling

reports, other agency reports, correspondence and other documents. Because this information is extensive and should be contained in EPA's own files, G+W generally objects to the identification and submission of such requested documents and information. Furthermore, the documents generated by G+W's former facilities in Ashtabula, Ohio are presently in the possession of SCM Corp.; therefore, as set forth in G+W's Preliminary Statement, no non-privileged documents responsive to this request, apart from those provided by SCM to the EPA and those limited number produced by G+W herewith, are capable of being produced by G+W.

10) Provide all knowledge or information you may have regarding any property owned by you in Ashtabula County, Ohio, which may have been contaminated by prior owners or users. Your response should include, but not necessarily be limited to:

- a) names of prior owners or users.
- b) use of facility and property by prior owners or users.
- c) disposal practices of prior owners or users.
- d) volume and nature of sources of such contamination.

Response:

As set forth in its Preliminary Statement, at this time G+W has no responsive documents in its possession,

custody or control, apart from those provided to G+W by SCM. However, G+W notes that in response to No. 11 of the EPA's Request for Information directed to SCM, SCM produced numerous responsive documents relating to Cabot Corp. and its subsidiary Cabot Titania, Inc. See SCM Document Nos. 000640 - 001527; 001561 - 001709

11) Provide all information you may have regarding any other sources of contamination to Fields Brook.

Response:

G+W objects to this Request as calling for a speculative answer and as being overbroad and unduly burdensome. Without waiving this objection, G+W is aware of information which is publicly available, including studies performed by or for the Ohio EPA or the EPA. G+W's other information is derivative of those of third persons, as set forth in the foregoing Preliminary Statement.

12) Provide the following information regarding any sewer lines (including storm, sanitary or combined sewers) or french drains which receive or have received runoff or discharges from any TAC property which may discharge into the Fields Brook, or into the Fields Brook drainage basin:

a) The location and nature of each sewer

line.

- b) Whether each sewer line is connected to the main trunk line.
- c) Does any sewer line have direct or indirect access to Fields Brook or a tributary thereof?

Response:

a. The location of existing sewage lines and drainage are indicated on drawings provided to G+W by SCM and marked by SCM as Documents 001954 - 001982. Additional drawings are referenced in SCM's response to Request No. 13 of EPA's Request for Information, and designated as documents 001534 - 001560, but were not provided to G+W by SCM. G+W provides the following information, already contained in SCM's response to Request No. 13:

<u>Titanium Dioxide Plant</u>			
<u>Number</u>	<u>Date</u>	<u>Description</u>	
E-4978-426	07/12/63	Lummus	Underground Piping: Settling Basin Area
E-4978-427		Lummus	Underground Piping: Water Treatment Area
E-4978-428	04/03/63	Lummus	Underground Piping: Boiler and CO Generation Area
E-4978-429		Lummus	Underground Piping: Cl2 Recovery, Feed Gas and Oxidation Area
E-4978-430		Lummus	Underground Piping: Wet Aftertreatment, Drying and Packing Areas
E-4978-431		Lummus	Underground Piping: Warehouse and

# RR Track Areas

E-4978-432		Lummus	Underground Piping: Shop and Electrical Substation Area
E-4978-433		Lummus	Underground Piping: Administration, Lab And Parking Areas
E-4978-434	03/29/63	Lummus	Underground Piping: Middle Road to Fields Brook
E-4978-148A	01/03/63	Lummus	Roads, Grading and Drainage
E-4978-710	06/05/63	Lummus	Finished Grading Plan
D-4978-701	05/15/62	Lummus	Grading Elevations
45-C-2013	07/15/64	Cabot	Sewers from H2SO4 Scrubbing System
30-D-2012	04/13/66	Cabot	Underground Piping: Cooling Tower
80-D-2506	12/08/71	McKee	No. 5 Pond
80-D-2507	12/13/71	McKee	Storm Sump PA-473
80-D-2509	12/08/71	McKee	Storm Water Sumps at Titanium Dioxide
80-D-2510	12/27/79	G+W	Drainage Trench - WAT Building
80-D-1505	02/09/72	NJZ	Waste Treatment System
80-D-1506	02/17/72	SCM	Waste Treatment System
30-D-2505	12/30/74	NJZ	Underground Piping: Titanium Dioxide Area
45-C-2507	07/12/79	G+W	FG-7 and Acid Trench
30-D2507	05/13/80	G+W	Trench for Lime Pumps
45-D-2513	10/02/81	G+W	Area Trench System - Cl2 Recovery
60-D-2180	08/17/84	SCM	Underground Piping - Spray Dryer Area
90-D-2870	05/22/85	SCM	Underground Drainage Plan
45-D-2508			Trenches in Cl2 Recovery Area

Titanium Tetrachloride Plant

<u>Number</u>	<u>Date</u>	<u>Description</u>	
3897-15-D-1501	10/06/71	Cabot	Plot Plan Titanium Tetrachloride Area
10-D-2020	03/06/65	Cabot	Underground Piping: Sanitary and Storm Water
10-D-2036	06/06/66	SCM	Process Trench
10-D-2064	12/27/56	Stauffer	Sanitary Drainage System Details
15-D-2503	10/28/71	Cabot	East Pond
15-D-2504	10/28/71	Cabot	East Sump
15-D-2506	02/09/72	Cabot	North Sump
15-D-2508	02/14/71	Cabot	Trench for Effluent Treatment System
15-D-1501	01/31/72	NJZ	Waste Treatment System
10-D-2529	06/07/79	G+W	Process Trench
10-D-2564	02/01/85	G+W	Process Trench
10-D-2548	12/02/83	G+W	Process Trench
10-D-2552	01/13/84	G+W	Process Trench
10-D-2553	02/01/85	SCM	Process Trench
10-D-2102	06/15/84	SCM	Process Trench
10-D-2555	02/24/84	G+W	GA-510 Sump and Trenches
10-D-2556	02/28/84	G+W	GA-510 Sump and North Trench to Fields Brook
10-D-2566	04/24/84	G+W	Drainage Ditch at Waste Treatment Area
10-D-2568	07/24/84	G+W	North Gate Catch Basin
No Number			Sanitary and Storm Water Piping

b. As set out by SCM in its Response to  
Request No. 13, all sanitary sewer lines at the titanium

dioxide unit led to the aerator and from there to the process wastewater treatment system at the titanium tetrachloride unit. All sanitary sewer lines at the titanium tetrachloride unit lead to a trickling filter and from there to the process wastewater treatment system.

All storm sewers at the titanium dioxide unit lead to settling ponds. All storm sewers at the titanium tetrachloride unit lead to the process wastewater treatment system.

All process sewers at the titanium dioxide unit are combined and pumped to the wastewater treatment system at the titanium tetrachloride unit. All process sewers at the titanium tetrachloride unit lead to the wastewater treatment system.

c. As set out by SCM in its Response to Request No. 13, sewer lines have indirect access to Fields Brook, but only after the discharge passes through the wastewater treatment system and facilities.

13) Provide the following information regarding any drainage ditches which receive or have received runoff or discharges from any TAC property and which are within, pass through, or may discharge into the Fields Brook drainage basin.

- a) The location of each drainage ditch.
- b) Whether runoff or discharge from each

drainage ditch has direct or indirect access to Fields Brook or a tributary thereof.

- c) Any information regarding the presence, or potential for releases, of hazardous substances or constituents in the ditches.

Response:

- a. See Response to No. 12.
- b. There is indirect access to Fields Brook, but only after the discharge passes through the wastewater treatment system.
- c. To the extent that any responsive documents in G+W's current possession are privileged, G+W objects to their production. Without waiving this objection, G+W has no unprivileged documents in its current possession relating to the release of hazardous substances or constituents in such drainage ditches, except those which have already been submitted to U.S. EPA by SCM or which are available to U.S. as a matter of internal record.

14) Does TAC have, or did TAC ever have, an NPDES permit for discharges to Fields Brook or a tributary thereto? Please identify any such permits.

Response:

At all relevant times G+W operated under authority of NPDES Permit No. E-317BD and/or 31E0017CD and/or other valid permits. On August 14, 1984, G+W and SCM

jointly applied for the transfer of G+W's responsibility and coverage under OEPA NPDES permit No. 31E00017CD to SCM effective October 31, 1983 ("NPDES Joint Application"). A copy of the NPDES Joint Application is attached as Exhibit E.

15) Describe each manufacturing process that has been operated at all plants owned or operated by TAC at its Ashtabula County, Ohio, facilities. For each facility and process provide the years that the operations occurred and all the raw materials associated with or relating to the process.

Response:

In its Response No. 19 to the EPA's Request for Information, SCM produced an undated "Process Flow Sheet and Description," Document No. 000613 - 000632, relevant to New Jersey Zinc Co.'s process for manufacturing titanium dioxide pigments. G+W is producing herewith as Exhibit F an undated document entitled "The New Jersey Zinc Company Ashtabula Chloride Titanium Dioxide Plant," a section of which is nearly identical with the process description in SCM's Document No. 000613 - 000632. As set forth in its foregoing Preliminary Statement, G+W, to the best of its knowledge, has no other responsive documents in its possession, custody or control.

16) Describe any hazardous substances that may have been contained in any by-product or wastes from each of the manufacturing processes described in Request 15. Also, describe the amounts of waste, by-products or hazardous substances generated by each of such processes on a yearly basis.

Response:

Based upon the limited information available at this time, G+W has no reason to believe that SCM's description of solid wastes generated by manufacturing prior to 1984 is not accurate. See Response of SCM to EPA's Request for Information No. 19.

17) Describe the storage, treatment and disposal practices for any by-product or wastes associated with each of the manufacturing processes described in response to Request 15. This description should identify any use of drums, tanks, lagoons, ponds, waste piles, ditches, marshes, swamps, land treatment or disposal areas, public sewers, landfills, creeks, or waterways used or affected by such practices.

Response:

Based on the limited information available at this time, G+W has no reason to believe that SCM's description of such practices is not accurate. See Response of SCM to EPA Request for Information No. 21.

18) Describe the nature and state of any records and recordkeeping practices that have ever been maintained relating to any storage, treatment or disposal practices for any by-products or wastes associated with each manufacturing process described in response to Request 15.

Response:

See Response of SCM to EPA's Request for Information, No. 22 at page 37. In addition, G+W has in its possession certain internal "Pollution Control Reports" for the period March, 1976 to November, 1979, copies of which are attached hereto as Exhibit G.

19) Describe each chemical reclamation process that TAC has operated at its Ashtabula County, Ohio facilities. For each facility and process state the years during which operation of the process occurred, the type of process equipment used, the types of chemicals associated with each reclamation process, the volume processed annually by each process, and the sources of the chemicals.

Response:

Based upon the limited information available at this time, G+W has no reason to believe that any chemical reclamation process was operated at its former facilities. See SCM's Response to Request No. 23.

20) Describe the nature and state of any records and recordkeeping practices that have ever been maintained relating to the volume and kinds of chemicals received and processed as described in response to Request 19.

Response:

Not applicable. See Response to Request No. 19.

21) Describe the characteristics and the nature of wastes or by-products associated with each reclamation process. Such description should include any characteristic or listing that such waste would likely have under 40 CFR Part 261. The description should also include any hazardous substances the waste would likely contain.

Response:

Not applicable. See Response to Request No. 19.

22) Describe the nature and state of any records and recordkeeping practices that have ever been maintained relating to the characteristics and nature of the wastes or by-products described in response to Request 22.

Response:

Not applicable. See Response to Request No. 19.

23) Describe the practices and conditions relating to the storage of hazardous wastes or hazardous substances upon their arrival at each of TAC's Ashtabula County, Ohio facilities, until the time of their reclamation. Such a description should include, along with any dates when any significant changes occurred:

- a) what types of wastes were/are stored in drums.
- b) what types of wastes were/are stored in tanks.
- c) what types of containment systems for spills or releases were provided at the storage areas.
- d) the location of any storage areas.
- e) whether drums have been marked with the generator's or transporter's name.
- f) whether hazardous wastes from more than one source were ever mixed or commingled in a tank. How common was this practice? Did this include emptying drums into tanks?
- g) what was the practice regarding the cleanup of spilled materials from these stored hazardous wastes.
- h) did spills or releases (including those caused by fire) of these materials ever occur while they were awaiting processing.
- i) whether such wastes were ever stored in lagoons or ponds.
- j) what types of such wastes were stored in lagoons or ponds.
- k) what type of liner or any other impervious barrier did lagoons or ponds have to prevent the release of materials.

- l) what types of wastes, if any, were ever stored in waste piles.
- m) what records and recordkeeping practices have ever been maintained on storage and what is the state of those records?

Response:

19. Not applicable. See Response to Request No.

24) Describe TAC's practices relating to the disposal and treatment of still bottoms, sludges and other non-reclaimed materials accumulated in any reclamation process itself. Please include in such a description, along with the dates for different practices:

- a) whether the non-reclaimed materials were drummed up for disposal.
- b) if such non-reclaimed materials were drummed up, whether they were normally [or necessarily] put back in the drums of the seller from whom they originated.
- c) whether the non-reclaimed material was allowed to accumulate and was stored prior to treatment or disposal.
- d) the locations and types of storage areas used for storage of the non-reclaimed materials. Examples of types of storage areas could include drums, tanks, pits, waste piles, ponds or lagoons.
- e) any containment systems utilized at these storage areas to help prevent releases of the stored material to the environment.
- f) whether any spills or releases of these stored materials ever occurred. Approximately when.
- g) where and how such materials were disposed.

- h) what records and recordkeeping practices have ever been maintained in regard to the above practices. What is the state of those records?

Response:

Not applicable. See Response to Request No.

19.

25) Describe practices relating to any incineration processes used for disposal of wastes from each of TAC's Ashtabula County, Ohio facilities. This description should include:

- a) the location and years during which each incinerator operated.
- b) the rated capacity for each incinerator.
- c) the normal operating and peak temperature for each incinerator.
- d) the rated retention time for materials during the burn.
- e) the type of fuel used to bring the incinerator up to operating capacity.
- f) how the material was fed to the incinerator.
- g) what types of operating records were kept, including temperature and feed rate.
- h) the types of air pollution control devices that were installed on each incinerator and stack test results.
- i) whether any misting or raining from the incinerator stacks ever occurred.
- j) what quantities of incinerator ashes or sludges were generated from the

incineration processes.

- k) what types of materials and volumes were burned in these incinerators.
- l) were any PCBs known to have been burned in these incinerators.
- m) did the materials that were burned include non-reclaimable materials from stills.
- n) were materials from stills accumulated and stored prior to incineration.
- o) did the materials sent to TAC include materials sent there solely for purposes of incineration.
- p) were materials sent to TAC for incineration on occasion otherwise disposed. How and why?
- q) how and where were by-products of the incineration process (including ash bottoms, fly ash, sludges and scrubber water) disposed.
- r) any records and recordkeeping practices that have ever been maintained relating to the described practices. What is the state of those records?

Response:

To the best of its knowledge, information and belief, G+W's plants did not use an on-site incineration process for disposal of wastes.

26) Has TAC ever disposed or arranged for the disposal of any materials in the Reserve Environmental Services, Inc. landfill? If so, please state:

- a) when the disposal occurred.

- b) the nature of the solid and liquid wastes.
- c) whether the wastes contained hazardous substances.
- d) the amount of wastes involved.
- e) if known, where at Reserve's landfill the wastes were disposed.
- f) describe all terms of any arrangement for the disposal of these materials.
- g) what records, if any, have ever been maintained documenting such disposal and arrangements for disposal.

Response:

RES's facilities are outside of the Fields Brook watershed and therefore G+W objects to this Request as being irrelevant.

27) Has TAC ever observed any leachate escaping or being released from any TAC storage or disposal areas on property owned or operated by TAC? If so, describe the location and physical characteristics of the leachate such as color, odor or viscousness. When and by whom has this been observed?

Response:

To the best of G+W's knowledge, information and belief, no.

28) Do you have any information indicating that leachate from the TAC storage or disposal areas on

property owned or operated by TAC in Ashtabula County, Ohio, may have escaped or been released into surrounding ditches, Fields Brook or a tributary thereof? If so, please state it, and include when such occurrences took place and who observed them.

Response:

No.

29) Have soil samples been collected and analyzed or monitoring wells ever been installed in or adjacent to the property to monitor for releases of pollutants or hazardous waste constituents? If so, please provide any data you have from such monitoring activities.

Response:

To the extent that any responsive documents in G+W's current possession are privileged, G+W objects to their production. Without waiving this objection, G+W has no non-privileged documents in its current possession relating to such sampling or monitoring, except those non-privileged documents which have already been submitted to U.S. EPA by SCM or which are available to U.S. EPA as a matter of internal record.

30) Describe any location on TAC property located in the Fields Brook water basin at which wastes from

TAC operations have been disposed. Please state the approximate time of disposal, the types of materials, their chemical characteristics and volumes involved. Also, provide any information you have regarding sample analyses that have been conducted of material in or adjacent to any other locations on TAC property in the Fields Brook water basin at which wastes from G+W operations have been disposed.

Response:

See Response No. 31, below, which reproduces SCM's Response No. 35 to the EPA's Request for Information directed to SCM. As appears on maps known to the U.S. EPA, G+W's titanium tetrachloride plant had a landfill at which non-hazardous wastes were disposed of. G+W has no other information in its possession which would be responsive to this Request.

31) Describe the location and size of each lagoon, pond, waste pile, trench or pit that has existed on the TAC property and its purpose. For each lagoon, pond, waste pile, trench or pit describe:

- a) Any hazardous substances that may be or have been contained in them.
- b) The dates of each structure's existence and use.
- c) Any construction properties of each pit, pond, waste pile, trench or lagoon which would help prevent the release of materials from it.

- d) If not in use now, explain how it was closed or has been modified and the present use of the area.
- e) Any pictures, sketches or maps of these facilities.

Response:

Listed below are the ponds, thickener and clarifier located at G+W's former facilities. All ponds were used for wastewater treatment purposes and are located in the highly impermeable clay which underlies both facilities. The information described is identical to that forming SCM's Response to No. 35 in the EPA's Request for Information directed to SCM, and as set forth in the Preliminary Statement, G+W has no independent access to this information. Maps showing the location of those ponds were provided to EPA by SCM in its Documents 001974 - 001982.

Titanium Dioxide Area

Pond 1	50' x 135' x 11' Deep	Built - 1963
Pond 2	50' x 135' x 11' Deep	Built - 1963
Pond 3	50' x 135' x 11' Deep	Built - 1963
Pond 4	50' x 135' x 11' Deep	Built - 1963
Pond 5	Northwest Pond 130 x 180 x 9' Deep	Built - 1972

Titanium Tetrachloride Area

North Pond	20' x 200' x 13' Deep	Built 1957
South Pond	20' x 200' x 13' Deep	Built 1957
Thickener (BG-119)	185 Ft. Diameter x 15' Deep	Built 1972

East Pond	85' x 90' x 5 Ft. Deep	Built 1972
Clarifier	22' x 106' x 10'9" Deep	Built 1967

Sampling data of the contents of the above facilities have been previously submitted to EPA and Ohio EPA.

Filtercake from the neutralization system at the titanium tetrachloride plant was placed in piles in the northeast portion of that plant from 1972-77. These piles are located over the highly impermeable clay which exists throughout the plant. These piles are covered with vegetation. See Documents 002018 - 002019, provided to G+W by SCM. G+W has no access to other documents listed in SCM's Response No. 35 at page 48.

32) Provide the name of each customer from whom TAC has received hazardous substances for purposes of treatment or disposal, including incineration or reclamation. Further, provide any information you have on the kind of waste received, the quantity of each kind of waste received, the processes used by TAC in handling these wastes, the period during which each kind of waste was received and processed and the likely disposition of any residues from that process.

Response:

To the best of its knowledge, information and belief, G+W did not receive hazardous substances for purposes of treatment or disposal from any third party or "customer."

33) Provide copies of any documents that you now have that contain information indicating the receipt of hazardous wastes for reclamation, incineration, or other treatment by TAC. Such documents would include logs, invoices, bills of lading, purchase orders, work orders, trucking records, correspondence, contracts or other agreements.

Response:

Not applicable.

34) Provide the names of all other off-site facilities that have been used by TAC for the disposal of unreclaimed chemical wastes and hazardous wastes, incineration process wastes and manufacturing process wastes. Provide the dates during which such disposal has occurred and the kinds of wastes sent to each facility.

Response:

G+W has no documents in its current possession that indicate that G+W used any off-site facility within the Fields Brook basin for disposal of any wastes.

35) Provide any information you have regarding the waste disposal methods utilized by any surrounding property owners or users.

Response:

The only such information known to G+W is that obtained through the documents released by the U.S. EPA to G+W and other potentially responsible parties pursuant to their joint Freedom of Information Act request. These documents, consisting of the responses of surrounding property owners and users as made to the EPA's Requests for Information are obviously within the knowledge of the EPA.

36) Describe any information TAC may have obtained regarding contaminated fill material or debris deposited in or near Fields Brook or its tributaries. Such should include any information regarding fill allegedly disposed by Brenkus Excavating at or near the residence of Sandra Herl, 935 East 19th Street, Ashtabula, Ohio, or any other location within or which may impact the Fields Brook drainage basin.

Response:

A search of the remaining business records of G+W in its possession, custody or control disclosed no responsive documents.

37) A list and description of all liability insurance coverage that is or was carried by you or any predecessor or successor corporations or partnerships, including any self-insurance provisions, that relates to hazardous substances and/or the above referenced sites. Provide copies of all of these insurance policies.

Response:

G+W objects to this Request as vague, over-broad and outside the scope of 42 U.S.C. §§ 6927 and 9604. Without waiving its objection, G+W states that it has maintained numerous liability insurance policies for its multiple facilities in the United States during the relevant period.

38) Provide any information that you have concerning the disposal of hazardous substances from operations at Reserve Environmental Services, Inc. including:

- a) description of the method of operations at the site (e.g. how drums were rinsed, materials used in drum cleaning, methods

of disposal of waste residues from drums, disposal of rinse water, etc.)

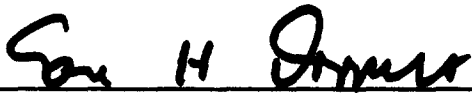
- b) the disposal locations used by Reserve Environmental Services for residues, rinse water and solid wastes generated by their operations. This description should include locations both on and off their properties.
- c) the disposal locations for any drums discarded by the company.
- d) the estimated quantity of drums and waste residue disposed of at each location by the company.
- e) whether the company received drums from persons other than TAC for cleaning.

Response:

G+W objects to this Request on the basis that the facilities of Reserve Environmental Services, Inc. are outside the relevant watershed. Without waiving this objection, G+W states that it has no information or documents in its possession responsive to this Request.

Dated this 14th day of July 1987.

GULF + WESTERN INC.

  
\_\_\_\_\_  
Earl H. Doppelt  
Vice President and Deputy  
General Counsel

As to Objections:

  
\_\_\_\_\_  
Michael A. Cyphert  
Attorney for Gulf + Western Inc.

STATE OF NEW YORK )  
 ) SS.  
COUNTY OF NEW YORK )

A F F I D A V I T

I, Earl H. Doppelt, being first duly sworn, state that I am Vice President and Deputy General Counsel of Gulf + Western Inc.; that while I do not have personal knowledge of all the facts recited herein, the information set forth is based: 1) upon examination of those records retained by Gulf + Western Inc. which were believed to have contained responsive information; 2) upon the Amended Response of SCM Corporation to the May 16, 1986 U.S. EPA Request for Information and some of the documents produced by SCM therewith, and is true to the best of my information belief and knowledge.

Earl H. Doppelt  
Earl H. Doppelt

Sworn to and subscribed before me this 14th  
day of July, 1986.

Elisa M. Rivlin  
Notary Public

ELISA M. RIVLIN  
Notary Public, State of New York  
No. 41-4877146  
Qualified in Queens County  
Qualified in New York County  
Commission Expires October 27, 1988

1

LEASE

THIS INDENTURE OF LEASE dated as of June 1, 1972, between CABOT CORPORATION and CABOT TITANIA, INC., both Delaware corporations, with their principal offices located at 125 High Street, Boston, Massachusetts 02110 (hereinafter called "Lessors") and THE NEW JERSEY ZINC COMPANY, a Delaware corporation, having its principal office at 2045 City Line Road, Bethlehem, Pennsylvania 18018 (hereinafter called "Lessee").

W I T N E S S E T H:

ARTICLE I

Lessors hereby lease to Lessee and Lessee hereby leases for the term and upon the terms and conditions hereinafter set forth, (a) all of the property described in Schedule A attached hereto and made a part hereof together with all buildings and improvements located thereon (said property or any part thereof is hereinafter called the "leased premises"), subject to (i) all easements, encumbrances, restrictions and agreements set forth in Schedule A, and any other easements, restrictions, agreements and matters of record which do not materially affect the production of titanium dioxide and titanium tetrachloride (the "Titanium Business") on the leased premises, (ii) except as hereinafter provided, all ordinances, statutes, regulations, orders and licenses of any governmental agency and any presently existing violations thereof whether or not of record, and (iii) the existing condition and state of repair of the leased premises, and (b) the machinery, equipment and personal

property described in Schedule B and made a part hereof, in its existing condition and state of repair (hereinafter called the "equipment"). The leased premises and equipment are hereinafter collectively called the "leased property".

## ARTICLE II

### INITIAL TERM

To have and to hold the leased property for an initial term of three (3) years beginning on the date hereof and ending on May 31, 1975.

## ARTICLE III

### OPTION TO EXTEND

Lessee may extend the initial term of this Lease for an additional three-year term, beginning immediately following the initial term, by written notice delivered to Lessors not later than December 31, 1974. Lessee shall have the further right during each extended term to extend for a further three-year term, beginning immediately after the then extended term, by written notice delivered to Lessors during the then extended term, but not later than five months prior to its expiration; provided, however, that in no case may this Lease be extended beyond May 31, 1993. Each such extended term shall be upon the terms and conditions as herein contained. At the option of Lessors, no extension shall be effective if at the time of exercise, or the beginning date of such extended term, Lessee is in default hereunder. The phrase "term of this Lease" shall mean the initial three-year term and all extended terms extended in accordance with this Article III.

ARTICLE IV

RENT

Lessee shall pay to Lessors for the initial three-year term of this Lease as rent for the leased property the sum of Two Million Five Hundred Thousand Dollars (\$2,500,000) payable in three (3) equal installments of Eight Hundred Thirty-three Thousand, Three Hundred Thirty-three and 33/100 Dollars (\$833,333.33) each with the first such payment due on the date hereof and with the succeeding payments due on the first and second anniversaries of this Lease. In the event that this Lease is extended, as provided in Article III above, the Lessee shall pay as rent for the leased property the sum of One Million Dollars (\$1,000,000) per year payable annually in advance on June 1 of each lease year during each extended term.

It is the purpose and intent of Lessors and Lessee that all rent payable hereunder shall be absolutely net to Lessors, and that all costs, expenses and obligations of every kind and nature whatsoever relating to the leased property (except any estate, inheritance, income or franchise tax due and payable by Lessors, and Lessors' obligations under Article VIII hereof) which may arise, accrue or become due during the term of this Lease shall be paid by Lessee, and Lessee shall indemnify and save Lessors harmless from and against the same.

Payment of rent shall be by bank wire transfer to the account of Cabot Titania, Inc. at The First National Bank of Boston.

ARTICLE V

OPTION TO PURCHASE

Lessee shall have the option to purchase all of Lessors' right, title and interest in the leased property effective only on (i) June 1, 1975, (ii) June 1 of any year thereafter during the term of this

Lease or (iii) the June 1st immediately following the expiration date of the term of this Lease. Notice of the exercise of the option shall be delivered to Lessors at least five months prior to the effective date, and shall specify the effective date, and which of the two alternate payment terms set forth shall apply. The purchase price is \$9,000,000, which is an amount equal to nine years' rent during the extended term, payable on the following terms:

- A. Nine Million Dollars (\$9,000,000) by bank wire transfer to account of Lessors at The First National Bank of Boston, on the effective date; or
- B.
  - (i) Seven Hundred Fifty Thousand Dollars (\$750,000) in like funds on each of June 1 and August 1 of the calendar year of the effective date, plus
  - (ii) Seven Hundred Fifty Thousand Dollars (\$750,000) in like funds on each of June 1 and August 1 of the calendar year next succeeding the calendar year of the effective date, plus
  - (iii) Nine Hundred Twenty-five Thousand Dollars (\$925,000) in like funds on August 1 of each of the second through fifth calendar years succeeding the calendar year of the exercise date, plus
  - (iv) the delivery on the effective date of five (5) promissory notes of Lessee of Four Hundred Sixty Thousand Dollars (\$460,000) each, maturing at one (1) year intervals

beginning one year from date of issuance with interest per annum due on maturity at a rate equal to the prime or equivalent rate (on the maturity date) at The First National Bank of Boston plus two percent (2%). Principal and interest on maturity of any such note will only be due in an amount not exceeding fifty percent (50%) of the amount by which net profits after taxes from operation of the leased property for the fiscal year ending July 31 of the year of maturity exceeds (a) Two Million Dollars (\$2,000,000), plus (b) One Million Dollars (\$1,000,000) for each ten percent (10%) expansion of the  $TiO_2$  capacity of the leased property above 25,000 tons per year, adjusted to an amount which bears the same relation to the sum of (a) and (b) above, as the average of the monthly wholesale price index figures for "all commodities", as published in "Wholesale Prices and Price Indexes", a publication of the United States Bureau of Labor Statistics, for the fiscal year for which the computation is being made bears to the average of such index figures for the twelve (12) month period ending July 31, 1972. Payment of principal and interest due on maturity of any such note will be made as soon after maturity thereof as net profits after taxes for the fiscal year ending July 31 of the year of maturity have been determined. Such determination shall be made by an independent certified public accountant approved by Lessors. To the extent that net profits after taxes in any fiscal year are insufficient to pay principal

and interest on the note maturing during that fiscal year, any amounts remaining unpaid at the end of that fiscal year shall be cancelled. The notes will be pre-payable in whole or in part at any time without penalty.

The closing of the sale on the effective date shall take place at the offices of Lessors, and Lessors shall deliver to Lessee on the effective date (a) its duly executed limited warranty deed for the leased premises, excluding from its warranties any exceptions to title permitted by Article I and any lien or encumbrances created by, through or under Lessee, and (b) its duly executed bill of sale for the equipment.

#### ARTICLE VI

##### DAMAGE OR DESTRUCTION OF LEASED PREMISES

In the event of damage to or destruction of the leased premises by any cause or casualty, whether or not insured against, Lessee at its sole expense with all due diligence shall restore the leased premises substantially to its condition prior to such damage or destruction. Lessee, at its sole expense, shall insure the leased premises against all risk of loss or damage at its full replacement value, with an insurance carrier acceptable to Lessors, naming Lessors as additional loss payees, and shall obtain from the said insurance carrier and provide to Lessors a certificate(s) evidencing the same, which certificate(s) shall provide that Lessors will be notified of cancellation or non-renewal when such notice is sent to Lessee. The replacement value shall be determined annually by Lessee, provided, however, that the Lessors shall have the right to challenge Lessee's valuation, and in case of continued disagreement

an appraisal shall be performed by an appraiser or appraisal company selected by Lessee and reasonably approved by Lessors, at the joint expense of Lessors and Lessee. All proceeds of such insurance shall be deposited in a joint trust account in a bank selected by Lessors and requiring the signatures of designees both for Lessee and Lessors for withdrawals, and shall be applied to the payment of such restoration, upon the certificate of a reputable architect, engineer or contractor in charge of such restoration, that the work represented by such payment has been completed. All such work shall be completed free of any material-men's, mechanics', laborers' or any other similar lien or liability for lien, and Lessee shall furnish at Lessors' request waivers of all such possible liens or other satisfactory protection against such liens, before each payment.

#### ARTICLE VII

##### REPAIR AND MAINTENANCE AND COVENANTS AGAINST WASTE

Lessee shall not cause or permit waste, damage or injury to the leased premises.

Lessee, at its sole expense, shall keep and maintain the leased premises in good condition and shall make all repairs including without limitation structural repairs (other than structural repairs required to correct defects known to Lessors on the date hereof, which will be made at Lessors' expense), replacements, additions and renewals of every kind and nature, both exterior and interior.

Except as provided in Article IX below, Lessee shall not remove or permit the removal of any improvement on the leased premises. All personal property belonging to Lessee shall be removed by Lessee at the request of Lessors promptly upon the termination of this Lease, and Lessee may remove such personal property upon the expiration of the term of this Lease and all damage to the leased premises caused by such removal shall be paid for by Lessee.

ARTICLE VIII

COMPLIANCE WITH GOVERNMENTAL AND INSURANCE REQUIREMENTS

Lessee at its sole expense shall observe and promptly comply with (a) all present and future laws, ordinances, regulations and requirements of any governmental agency asserting jurisdiction over the leased property, sidewalks and curbs adjacent thereto, or relating to the leased property and the operations thereon, including, without limitation, those with respect to pollution control, industrial safety and equal employment, and (b) all present and future requirements of all policies of insurance affecting the leased property and all recommendations of the Board of Fire Underwriters, or any board exercising similar functions, if failure to comply with any such recommendation or requirement is likely to result in the cancellation of any insurance policy, or in a refusal to pay any loss or claim under a policy. Lessee shall provide to Lessors copies of all insurance inspection reports on the leased premises.

Lessee at its sole expense may contest by appropriate legal proceedings in the name of Lessee, Lessors, or both, the validity or applicability of any such law, ordinance, regulation or requirement of any governmental agency, provided that Lessee shall have furnished reasonable security to Lessors against any liability or expense resulting from non-compliance. Lessee shall diligently prosecute any such legal proceedings and shall indemnify and hold Lessors and the leased property harmless against the consequences of such non-compliance.

Notwithstanding the above, Lessors shall at their own expense complete installation of facilities according to the plan for water effluent control submitted to the Department of Health of the State of Ohio and the United States Army Corps of Engineers, approved by the said Department of Health by letter dated August 13, 1971, and fully processed by said Corps of Engineers as of March 16, 1972. Lessors shall complete such installation ready for acceptance by said Department of Health on or about September 1, 1972, or such later date as the said Department of Health may establish. Upon completion, the said installation shall bring the water effluent from the leased premises into conformity with the following criteria adopted by the Water Pollution Control Board of the said Department of Health, acting pursuant to Section 6111.041 of the Ohio Revised Code, on October 10, 1967, as amended April 14, 1970, and March 14, 1972:

A. Minimum Conditions Applicable to All Waters at All Places and at All Times; and

B. Stream Water Criteria For Aquatic Life A.

Lessee agrees that it shall in no way interfere with Lessors' efforts to fulfill its obligation hereunder and will cooperate in every way necessary to insure due completion of said installation.

Lessors shall further obtain from the said Water Pollution Control Board of said Department of Health, prior to the completion date aforesaid, written assurance that construction of the waste treatment facility may go forward as planned, and that transfer of operation of the leased premises from Lessors to Lessee will not result in modification or cancellation of the conditions contained

in the August 13, 1971, letter of the said Department of Health.

If such assurance has not been obtained by the said completion date because the installation has not been completed or tested, Lessors shall at their own expense take all action necessary to obtain the same. If such assurance, or if approval of the installation by the said Water Pollution Control Board is not obtained after completion and testing of the installation because the criteria aforesaid are not met, Lessors shall have a reasonable opportunity to correct at their own expense any deficiency in the installation. Except as provided in Schedule C attached hereto, if Lessors fail to correct such deficiency, Lessee may, at its option, by written notice to Lessors delivered prior to January 1, 1973, terminate this Lease, and Lessors shall thereupon repay to Lessee all rent paid pursuant to Article IV above. Lessee agrees that any such termination shall be accomplished in an orderly manner to permit the transfer of the Titanium Business to Lessors without interruption.

#### ARTICLE IX

##### IMPROVEMENTS AND ALTERATIONS

Lessee may make such improvements and alterations, structural or otherwise, to the leased property as Lessee deems desirable in the conduct of the Titanium Business so long as the value of the leased property is not lessened nor the general utility of the leased property for the conduct of the Titanium Business is not diminished. No building or other improvement forming a part of the leased premises shall be removed or demolished unless such removal or demolition shall be in connection with improvements,

alterations and constructions which will not decrease the size or value of the building or other improvements on the leased premises. All such improvements and alterations shall be performed in accordance with the provisions of Article XII hereof.

#### ARTICLE X

##### EQUIPMENT

Lessee, at its expense, shall maintain, repair and service the equipment during the term of this Lease. Lessee shall also replace at its expense any equipment which may become obsolete or damaged beyond repair, and all title to such replacement equipment shall vest in Lessors immediately upon expiration or termination hereof unless Lessee purchases the leased property in accordance with Article V hereof, without payment or reimbursement therefor by Lessors except as provided in Article XI hereof. Lessee may remove from operation any equipment not required in the operation of the Titanium Business, and may dispose of the same provided Lessee first obtains the written approval of Lessors, which approval shall not be unreasonably withheld, and all proceeds from the disposition of such equipment shall be paid to Lessors.

Lessee, at its sole expense, shall insure the equipment against all risk of loss or damage, at its full replacement value, with an insurance carrier acceptable to Lessors, naming Lessors as additional loss payees, and shall obtain from the said insurance carrier a certificate(s) evidencing the same, which certificate(s) shall provide that Lessors will be notified of cancellation or non-renewal when such notice is sent to Lessee. The replacement value shall be determined annually by Lessee, provided that the Lessors shall have

the right to challenge Lessee's valuation, and in case of continued disagreement an appraisal shall be performed by an appraiser or appraisal company selected by Lessee and reasonably approved by Lessors, at the joint expense of Lessors and Lessee. In the event of damage or destruction of any equipment by any casue or casualty, whether or not insured against, Lessee, at its sole expense, with all due diligence, shall repair and restore the equipment substantially to its condition prior to its damage or destruction, or replace such equipment with the same or functionally equivalent equipment. All proceeds, if any, of such insurance paid by reason of such damage or destruction to the equipment shall be applied to the cost of such repair or replacement.

#### ARTICLE XI

##### CAPITAL IMPROVEMENTS

In the event that Lessee has made capital improvements during the term of this Lease, upon termination or expiration hereof, Lessors will reimburse Lessee for the excess of (a) the then net book value, as determined below, of those improvements (calculated using ten (10) year straight line depreciation for machinery and equipment and twenty-five (25) year straight line depreciation for structures and buildings) over (b) the net book value of those items of the leased property disposed of during the term of this Lease, determined as of the date of disposal, less amounts realized therefor and previously paid to Lessors, up to a value of One Million Dollars (\$1,000,000) to be paid in four equal annual installments, with the first such installment paid on the date of termination or expiration hereof, less, however, any damages due to Lessors in the event of termination for

the default of Lessee. Lessors shall not be required to so reimburse Lessee in the event Lessee purchases the leased property in accordance with the provisions of Article V. For the purposes of determining the amount of said excess net book value, if any, Lessors shall have the right to audit Lessee's books and records, and any disagreement on audit shall be submitted to a certified public accountant or accounting firm selected by Lessors and approved by Lessee, whose determination shall be final.

## ARTICLE XII

### WORK PERFORMED BY LESSEE

All repairs, improvements, alterations, restorations or other work performed to or on the leased property by Lessee shall be done in a good and workmanlike manner and in compliance with the building and zoning laws, and with all other applicable laws, ordinances, orders, rules, regulations and requirements of all federal, state and municipal governments; shall be in accordance with the orders, rules and regulations of the Board of Fire Underwriters or any other body now or hereafter constituted exercising similar functions; shall be diligently prosecuted; shall be free of liens and encumbrances, and immediately upon expiration or termination hereof shall, unless Lessee purchases the leased property in accordance with Article V hereof, become the property of Lessors without payment or reimbursement therefor by Lessors except as provided in Article XI hereof.

ARTICLE XIII

UTILITIES

Lessee shall pay or cause to be paid all charges incurred by Lessee for electricity, gas, light, heat, water and power and for telephone, protective and other communication services, and for all other private or public utilities or services used, rendered, supplied, consumed or provided upon, to or in connection with the leased property at any time during the term of this Lease.

ARTICLE XIV

PROPERTY TAXES

All real and personal property taxes assessed against the leased property for any period during the term of this Lease shall be at the expense of Lessee, and any amounts billed to and paid by Lessors shall be reimbursed by Lessee to Lessors within ten (10) days of receipt of notice of payment from Lessors. For the purposes hereof, all real estate taxes, both general and special, levied or assessed against the leased premises and personal property taxes payable with respect to the equipment shall be prorated between Lessors and Lessee at the commencement and termination or expiration of this Lease (provided that no proration shall be made upon expiration or termination in the event Lessee purchases the leased property in accordance with Article V hereof). All such real property taxes shall be deemed to be assessed on January 1 of each year for the calendar year just ended and shall be prorated accordingly, and all such personal property taxes shall be deemed to be assessed for the calendar year in which the personal property tax return is due and shall be prorated accordingly.

Lessee shall have the right to protest or otherwise contest the property tax assessments against the leased property for any period during the term of this Lease. Lessors agree to permit Lessee to file such protests and take such legal action in the name of Lessors as Lessee shall see fit, provided that the same shall be at the sole cost and expense of Lessee. Lessors agree to cooperate with Lessee in connection with any such protests and legal action.

#### ARTICLE XV

##### INSPECTION AND AUDIT OF LEASED PROPERTY

Lessors or their representatives may enter the leased premises at any reasonable time for the purpose of inspecting and auditing the leased property and Lessee's books of account with respect thereto, performing any work which Lessors elect to undertake by reason of Lessee's default under the terms of this Lease, or exhibiting the leased property for sale or mortgage financing.

#### ARTICLE XVI

##### ASSIGNMENT

This Lease shall inure to the benefit of and be binding on the parties hereto and their respective successors and assigns, provided, however, that Lessee, its successors or assigns, shall not assign, transfer, mortgage, or sublease the leased property or any interest therein or any part thereof without the prior written approval of Lessors. However, Lessee may, upon notice to, but without permission of Lessors, assign or sublet the whole or any part of the leased property to the parent company of Lessee or a subsidiary of such parent for the purpose of conducting the Titanium Business, on condition that such assignment or subletting shall not relieve Lessee from its obligations under this Lease.

ARTICLE XVII

DEFAULT

(a) If Lessee shall be in default in the performance of any obligation other than an obligation to pay money under this Lease and such default is not cured within thirty (30) days after written notice thereof; or, as to a default which cannot reasonably be cured within such thirty (30) day period, if Lessee shall not have promptly commenced curing such default within such thirty-day period, or shall not thereafter proceed with reasonable diligence in good faith to remedy such default; or

(b) If Lessee shall be in default in the payment of rent or any other obligation hereunder of Lessee to pay money to Lessors, and such payment is not made within five (5) days after written notice of such default to Lessee; or

(c) If Lessee shall be adjudicated a bankrupt, make a general assignment for the benefit of creditors, file a voluntary petition in bankruptcy or for reorganization under The Bankruptcy Act, or if a receiver be appointed for all or a substantial part of the business and property of Lessee on petition of Lessee; or

(d) If any such petition or proceeding of the same or similar kind or character be filed or taken against Lessee, or any receiver for all or a substantial part of the business and property of Lessee should be appointed by any court in any proceedings brought against Lessee, and such petition or proceeding should not be set aside or dismissed or the appointment of said receiver be not revoked within ninety (90) days; or

(e) If the leased premises becomes vacant or deserted for a period of thirty (30) days, and such default is not cured within fifteen (15) days after written notice thereof to Lessee; or

(f) If this Lease shall be mortgaged, assigned or transferred or the leased property sublet other than in accordance with the terms hereof; then and in any one or more of such events, in addition to

any other remedies available to Lessors, Lessors shall be entitled, at their election, to exercise concurrently or successively, any one or more of the following rights and remedies:

(i) To bring suit for the collection of rent or other amounts for which the Lessee may be in default or for the performance of any other obligation of Lessee, or damages therefor, without entering into possession or terminating this Lease;

(ii) To re-enter the leased premises by summary proceedings or otherwise, and take possession thereof and of the leased property, without thereby terminating this Lease, and re-let the leased property or operate or cause the leased property to be operated upon such terms according to Lessors' sole discretion, and receive the income therefrom, applying the same first to the payment of the reasonable expenses of such action, and then to the payment of rents accruing hereunder, and Lessee, whether or not the leased property is re-let or operated, shall remain liable for any deficiency which may be recovered by Lessor periodically upon the successive days upon which the rent hereunder is payable;

(iii) To terminate this Lease by giving five days' notice of their intention to so terminate, re-enter the leased premises and take possession thereof and the leased property, wholly discharged from this Lease. In the event Lessors shall elect to terminate this Lease as aforesaid, all rights and obligations of the Lessee and any persons claiming under the Lessee shall cease and terminate,

except that Lessors shall have and retain full right to sue and collect for all rents and other amounts for the payment of which Lessee shall then be in default, and damages to Lessors by reason of such breach which shall have accrued up to the date of Lessors' re-entry; and Lessee shall surrender and deliver up the leased property to Lessors. Lessee hereby expressly waives any legal requirement for notice of intention to re-enter and any right of redemption granted by or under any present or future laws.

(g) If Lessee shall at any time during the term hereof be adjudicated a bankrupt, then this Lease shall automatically terminate, and Lessors shall be entitled to receive all rent and other amounts due from Lessee under this Lease and accrued to the date of the adjudication, and in addition the amount, if any, for damages as shall be allowable under any then existing statutes.

#### ARTICLE XVIII

##### ARBITRATION

Except as provided in Article XI hereof, any party hereto shall have the right to submit any dispute or disputes arising hereunder to arbitration under the rules of the American Arbitration Association, which arbitration shall be held in Boston, Massachusetts.

#### ARTICLE XIX

##### SEVERABILITY

If any provision of this Lease shall be declared invalid or unenforceable, the remainder of the Lease shall continue in full force and effect.

ARTICLE XX

NOTICES

Any notice given under this Lease shall be in writing, and shall be deemed to be given, delivered or served when delivered personally to an officer of each of the Lessors or Lessee, or when deposited in the United States Mail, registered mail, postage prepaid, and addressed as follows:

If to Lessors: Cabot Corporation  
125 High Street  
Boston, Massachusetts 02110

Attention: Secretary ; and

Cabot Titania, Inc.  
c/o Cabot Corporation  
125 High Street  
Boston, Massachusetts 02110

Attention: Secretary

If to Lessee: The New Jersey Zinc Company  
2045 City Line Road  
Bethlehem, Pennsylvania 18017

Attention: Vice President, Manufacturing

or to such other last address as any party hereto may, from time to time apprise the other parties in writing.

ARTICLE XXI

USE AND SURRENDER OF LEASED PROPERTY

Lessee shall use the leased property during the term of this Lease only for the purpose of operating the Titanium Business, and related chemical operations.

Upon termination or expiration of this Lease, Lessee shall surrender all the leased property not disposed of in accordance with Article X hereof in good order and repair, reasonable wear and tear excepted.

ARTICLE XXII

QUIET ENJOYMENT

The Lessors hereby covenant and agree that if the Lessee shall perform all the covenants and agreements herein to be performed by Lessee, Lessee shall at all times during the term hereof, subject, however, to the matters set forth in Article I hereof, have the peaceable and quiet enjoyment and possession of the leased property without any manner of let or hindrance from Lessors or any person or persons lawfully claiming the leased property under Lessors.

ARTICLE XXIII

WAIVERS

No waiver by any party at any time, express or implied, of any breach of any provision of this Lease shall be deemed a waiver of a breach of any other provision of this Lease or a consent to any subsequent breach of the same or any other provision. Failure of either party to complain of any act or omission on the part of the other party, no matter how long the same may continue shall not be deemed to be a waiver of any of its rights hereunder. If any action by either party shall require the consent or approval of the other party, the other party's consent to or approval of such action on any one occasion shall not be deemed a consent to or approval of said action on any subsequent occasion or a consent to or approval of any other action on the same or any subsequent occasion.

ARTICLE XXIV

INDEMNIFICATION

Except for those claims and fines with respect to which Lessors have agreed to indemnify Lessee as provided in Section 14 of the Asset Sale Agreement of even date between the parties hereto, and except for matters arising out of Lessors' performance or failure to perform their obligations under Article VIII hereof, Lessee hereby indemnifies and agrees to save, hold and keep Lessors safe, harmless and indemnified and defend the Lessors and the leased property at Lessee's expense against any and all claims, demands, penalties, judgments, expenses, reasonable attorneys' fees and liabilities of any and every kind:

- (a) arising from the conduct or management of or from any occurrence on or about the leased property or on any adjoining streets, curbs or sidewalks;
- (b) arising from any default by Lessee hereunder; or
- (c) arising from any act or negligence of Lessee, its agents, contractors, employees or any occupant of the leased premises.

ARTICLE XXV

COMPLIANCE WITH OTHER DOCUMENTS

Throughout the term of this Lease, Lessee, at its sole expense, will comply with all covenants, agreements, conditions, restrictions, easements, reservations and other provisions contained in any instruments of record or described in Article I hereof affecting the leased premises or any part thereof, insofar as any of the same may be in force, and to the extent that the same are to be performed with respect to the leased premises, except in a case where Lessors shall have agreed in writing that compliance therewith is not

necessary, in their judgment, to protect and preserve their interests in the leased property or this Lease.

ARTICLE XXVI

CONSTRUCTION OF LEASE

The title and paragraph headings in this Lease are for convenience and reference and are not intended to define or limit the scope of any provision of this Lease and shall not be considered in construing this Lease.

Signed and Acknowledged

in the presence of:

Barbara Germain  
Frank E. Doley

CABOT CORPORATION

By Arthur C. Chapin <sup>AM</sup>  
President  
And Walter F. Greeley  
Secretary

CABOT TITANIA, INC.

Barbara Germain  
Frank E. Doley

By Arthur C. Chapin <sup>AM</sup>  
Vice President  
And Walter F. Greeley  
Secretary

THE NEW JERSEY ZINC COMPANY

Barbara Germain  
Frank E. Doley

By Thos. J. J. J.  
Chairman  
And W. D. McQueen  
Secretary

IN TESTIMONY WHEREOF, I have hereunto set my hand and official seal at Boston, Massachusetts this 30th day of June, 1972.

Notary Public

My Commission expires:

COMMONWEALTH OF MASSACHUSETTS) ) ss.  
COUNTY OF SUFFOLK )

IN TESTIMONY WHEREOF, I have hereunto set my hand and official seal at Boston, Massachusetts this 30th day of June, 1972.

Notary Public

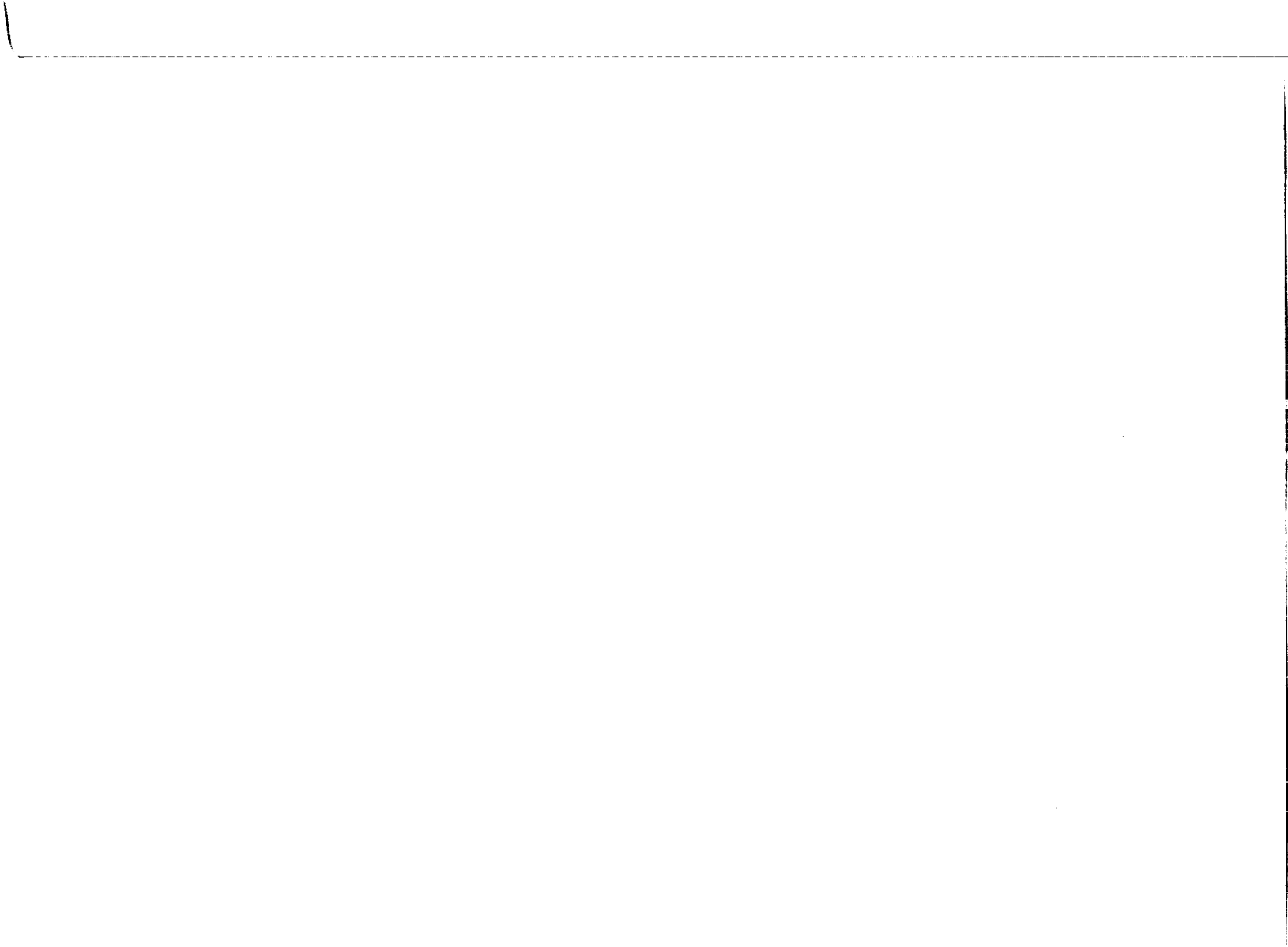
My Commission expires:

IN TESTIMONY WHEREOF, I have hereunto set my hand and official seal at Boston, Massachusetts, this 30th day of June, 1972.

**My Commission expires:**

August 30, 1974

Notary Public



## ASSET SALE AGREEMENT

AGREEMENT, made as of the 1st day of June, 1972, by and between CABOT CORPORATION, a Delaware corporation and CABOT TITANIA, INC., a Delaware corporation (hereinafter sometimes called individually and respectively "Cabot" and "CTI"; and collectively "the Sellers") on the one hand, and The New Jersey Zinc Company, a Delaware corporation (hereinafter called "NJZ") on the other hand.

### W I T N E S S E T H:

WHEREAS, the Sellers and NJZ have entered into a Memorandum of Agreement dated as of May 22, 1972 (hereinafter called the "Memorandum"), wherein it was agreed that the Sellers would transfer to NJZ by lease certain land, buildings and machinery located at Ashtabula, Ohio, and would sell and transfer and NJZ would purchase and receive certain other assets pertaining to CTI's business of manufacturing titanium dioxide ("TiO<sub>2</sub>") and titanium tetrachloride ("TiCl<sub>4</sub>"); and

WHEREAS, the Sellers and NJZ have this day entered into a lease agreement (hereinafter called the "Lease"), by which the Sellers have leased to NJZ, with options to extend or purchase, the land, buildings and machinery located in Ashtabula, Ohio (the "leased premises") with the view towards NJZ's utilizing the leased premises to carry on the business of manufacturing TiO<sub>2</sub> and TiCl<sub>4</sub> heretofore conducted by CTI; and

WHEREAS, Cabot and NJZ have also this day entered into an agreement by which Cabot has licensed NJZ to practice various patents and processes heretofore used by CTI in its  $TiO_2$  and  $TiCl_4$  business (hereinafter called the "License"); and

WHEREAS, the Sellers and NJZ wish to provide herein for certain transactions, including the sale and purchase of certain assets, not covered by the terms of the Lease and License.

NOW, THEREFORE, in consideration of the mutual promises contained herein, the parties hereto hereby agree as follows:

1. Sale and Transfer of Assets.

(a) Subject to the terms and conditions of this Agreement, each of the Sellers hereby agrees to sell, assign and transfer, and does hereby sell, assign and transfer, and NJZ agrees to purchase, assume and accept and does hereby purchase, assume and accept, the following assets (the "Assets") owned by Cabot or CTI and used in connection with CTI's  $TiO_2$  and  $TiCl_4$  business:

(i) all inventories extant on the date hereof at the leased premises and elsewhere of Finished  $TiO_2$  Inventory (as hereinafter defined),  $TiCl_4$ , raw materials, spare parts, supplies and work-in-process.

(ii) all unfilled purchase orders (except for those relating to certain capital projects as set forth in Section 4 hereof) and sales orders; and those other miscellaneous agreements listed in Exhibits A and E hereof, except those marked as requiring consents, which agreements shall be assigned to NJZ as provided in Section 5 below.

(iii) all customer lists, call reports, sales records and general business records (other than books of account) relating to the sale of  $\text{TiO}_2$  and  $\text{TiCl}_4$ .

(b) The assets transferred hereunder shall not include:

- (i) cash on hand
- (ii) accounts receivable
- (iii) assets covered by the Lease
- (iv) technology and patents covered by the License
- (v) trademarks

## 2. Purchase Price.

(a) The purchase price for each of the assets listed in Section 1(a)(i) hereof shall be the Book Value of such asset, adjusted as hereinafter provided, and the total purchase price for the Assets shall be the sum of such purchase prices.

(b) As used herein, the term "Book Value" shall mean, with respect to valuation of any of the Assets, the lesser of cost or market as determined on May 31, 1972, in accordance with generally accepted accounting principles consistently applied.

## 3. Payments and Adjustments.

Payment of the purchase price specified above, shall be made by bank wire transfer to CTI's account at The First National Bank of Boston as follows:

(a) NJZ shall pay the purchase price for Finished  $\text{TiO}_2$  Inventory as sold, on the dates when payments therefor should have been received had sales been made in accordance with Cabot's existing standard credit terms for such product. For the purposes hereof all sales of  $\text{TiO}_2$  made after the date hereof shall be deemed to have been on a first-in, first-out basis.

(b) NJZ shall pay the purchase price for  $\text{TiCl}_4$ , non-titanium-bearing raw materials, and work-in-process, immediately upon execution hereof.

(c) NJZ shall pay the purchase price for spare parts at the rate of Fifty Thousand Dollars (\$50,000) per month for nine (9) months with the first such payment to be made on June 30, 1972. On March 10, 1973, NJZ shall furnish to CTI a complete listing as of February 25, 1973, of all spare parts transferred hereunder and used or otherwise disposed of by NJZ prior to said date, and all spare parts which NJZ intends to use or otherwise dispose of after said date. For the purposes hereof any spare part transferred hereunder shall be deemed to have been used or otherwise disposed of prior to any equivalent spare part received by NJZ after the date hereof. CTI shall have the right to verify by audit the accuracy and completeness of said listing and its conformity with the terms hereof.

At the time of delivery of said listing, or upon completion of audit, NJZ shall pay to CTI an amount equal to the excess of the Book Value of the spare parts used or otherwise disposed of and to be used or otherwise disposed of by NJZ over Four Hundred Fifty Thousand Dollars (\$450,000); or within ten (10) days of receipt of said listing, CTI shall refund to NJZ an amount equal to the difference between said Book Value and Four Hundred Fifty Thousand Dollars (\$450,000). CTI shall direct NJZ as to the disposition, to CTI or for CTI's account, of all spare parts not used or otherwise disposed of or to be used or otherwise disposed of by NJZ. CTI shall not be obligated hereunder to repurchase any spare parts not maintained in good condition by NJZ.

(d) NJZ shall pay the purchase price for supplies immediately upon execution hereof. On September 10, 1972, NJZ shall furnish to CTI a complete listing as of August 25, 1972, of all supplies transferred hereunder and used or otherwise disposed of by NJZ prior to said date, and all supplies which NJZ intends to use or otherwise dispose of after said date. For the purposes hereof any supplies transferred hereunder shall be deemed to have been used or otherwise disposed of prior to any equivalent supplies received by NJZ after the date hereof. CTI shall have the right to verify by audit the accuracy and completeness of said listing and its conformity with the terms hereof.

At the time of delivery of said listing, or upon completion of audit, CTI shall repurchase supplies not used or otherwise disposed of by NJZ at their Book Value, and shall direct NJZ as to the disposition thereof to CTI or for CTI's account. CTI shall not be obligated hereunder to repurchase any supplies not maintained in good condition by NJZ. For the purposes of such repurchase obligation only, that quantity of 90,000 bags purchased under purchase order no. T8277 for delivery after the date hereof shall be considered part of the supplies included in the Assets.

(e) NJZ shall pay the purchase price for titanium-bearing ores in the silos on the leased premises on or before June 30, 1972.

(f) NJZ shall pay the purchase price for titanium-bearing ores in storage other than in silos on the leased premises by delivery on execution hereof of an instalment promissory note in the form attached hereto as Exhibit B, with a principal amount equal to approximately ninety percent (90%) of the estimated purchase price of said ores, guaranteed by NJZ's parent, Gulf & Western Industries, Inc. The purchase price for said ores shall be adjusted on a date

to be mutually agreed upon by the parties hereto, but not later than the date on which all of that quantity of said ore in storage in the main shed at Pinney Dock, Ashtabula, Ohio, has been delivered out of said storage, to reflect the actual quantity and cost of said ores determined to have been sold to NJZ hereunder, and an appropriate additional payment by NJZ, or refund or credit by CTI, shall be made within thirty (30) days of the final payment under the promissory note. CTI shall have the right to audit NJZ's books and records with respect to the calculation of amounts due from time to time under said instalment promissory note.

4. Capital Projects.

NJZ shall be responsible at its own expense for the due completion of all capital projects affecting the leased premises, except for the following which will be completed at CTI's expense:

- (a) CT-909 .... Sodium Silicate Heater; and
- (b) CT-916 .... Aluminium Chloride Load Cells; and
- (c) CT-917 .... Access Platform at Oil Heater; and
- (d) CT-897 .... Waste Treatment Facility referred to in

Article V of the Lease.

5. Assignments of Contracts Requiring Consent.

The Sellers hereby agree to use their best efforts to obtain consents required for the assignment of the agreements marked as requiring consents in Exhibit A hereof, and further agree to assign said contracts to NJZ upon receipt of said consents. CTI or Cabot, as the case may be, agrees to perform said contracts as NJZ shall reasonably direct until assigned by CTI or Cabot to NJZ; and NJZ shall reimburse all costs incurred by CTI or Cabot in connection therewith.

6. RMI Company.

With respect to the contracts dated January 1, 1971, between Cabot and CTI and RMI Company (the "RMI Contracts"), which are assigned to

NJZ as herein provided, the parties hereto agree as follows:

(i) If upon expiration of the initial term of the Lease without extension thereof by NJZ or exercise of NJZ's option to purchase as provided therein, NJZ has not extended or offered to extend the RMI Contracts beyond June 30, 1976, the parties hereto will make mutually acceptable arrangements, by lease or otherwise, for NJZ to operate all or part of the leased premises, as the parties may then decide, on a rent-free basis with no continuing or other option to purchase, through the earlier of June 30, 1976, or the date on which the Sellers dispose of that portion of the leased premises being operated in such a manner as to terminate NJZ's obligations under the RMI Contracts.

(ii) All operating profits or losses for the period of operation of all or part of the leased premises as provided herein beginning June 1, 1975, and ending no later than June 30, 1976, will be calculated in accordance with generally accepted accounting principles consistently applied and shared equally between CTI and NJZ.

7. Accounts Receivable.

NJZ will use its best efforts to collect all  $\text{TiO}_2$  and  $\text{TiCl}_4$  accounts receivable arising from shipments made prior to June 1, 1972, and outstanding to Cabot or CTI as of May 31, 1972 (Exhibit C). The Sellers will suspend their efforts to collect these accounts until August 31, 1972, except for those accounts which have been marked "joint collection" on Exhibit C hereto.

All sums received by NJZ, Cabot or CTI from any account debtor listed in Exhibit C hereto will be applied first to the oldest undisputed account outstanding from said account debtor on the date of receipt thereof, whether or not the payment has been specified to a later account.

NJZ will remit to Cabot or CTI on the second (2nd) business day following the last business day of each month all sums collected during said month, and on the tenth (10th) such business day will send to Cabot or CTI full documentary back-up, as received from each account debtor, and an activity summary showing all monthly payments from each listed account debtor. Cabot or CTI will keep all payments made directly to Cabot or CTI, and will report thereon monthly to NJZ.

8. Trade Name and Grade Designations.

The Sellers hereby grant to NJZ the right to utilize the Sellers' grade designations for  $\text{TiO}_2$  manufactured by NJZ at the leased premises during the term of the Lease. CTI also grants NJZ the right to use the name "Cabot Titania, Inc." for purposes reasonably connected with the production and sale of  $\text{TiO}_2$  and  $\text{TiCl}_4$  at the leased premises for a period of ninety (90) days from the date hereof.

9. Employee Benefits.

(a) Pension - Employees transferring to NJZ shall be entitled to pension benefits as follows:

(i) CTI or Cabot, as the case may be, shall provide each transferee with his or her accrued benefits as of the date hereof.

(ii) NJZ shall provide each transferee who terminates during the term of the Lease, or upon the expiration thereof without exercise of the option to purchase as provided in the Lease, with the pension benefits which would have accrued to such transferee, during the period

of his or her employment by NJZ, under CTI's or Cabot's pension plan if he or she had continued to work for CTI or Cabot during such period at his or her current rate of pay, unless at the time of termination such transferee's rights fully vest or have fully vested under NJZ's pension plan.

(iii) If NJZ exercises its option to purchase provided in the Lease, NJZ shall use the date on which each transferee remaining in the employ of NJZ on the effective date of the purchase was hired by CTI or Cabot for purposes of calculating the date on which the rights of such transferee vest under NJZ's pension plan; but such date of hiring shall not be used for purposes of calculating benefits for past services under NJZ's plan.

(b) Vacations - NJZ shall assume CTI's or Cabot's 1972 vacation liability on the date hereof to each transferee, and shall discharge such liability by providing vacation rights, during the remainder of calendar 1972, at least as favorable to each transferee as such transferee would have received had he or she remained in CTI's or Cabot's employment during such period. In consideration of NJZ's assumption and discharge of such vacation liabilities, the Sellers shall pay to NJZ on January 10, 1973, an amount equal to one-half (1/2) of the total calendar 1972 vacation cost actually borne by NJZ with respect to transferees, up to but not exceeding one-half (1/2) of the Sellers total unpaid calendar 1972 vacation liability to the transferees on the date hereof.

10. Obligations Upon Termination of the Lease

(a) Except as otherwise provided in Section 6 hereof, in the event that the Lease is terminated (other than due to default by Lessors under Article VIII of the Lease) or has expired without NJZ having exercised its option to purchase as provided therein, in addition to any other agreements contained in the Lease, the License or herein (except those contained in paragraph 10(b) hereof):

(i) NJZ shall have on hand and shall offer to sell to CTI or Cabot at NJZ's book value (determined in accordance with generally accepted accounting principles consistently applied and subject to audit at the option of CTI or Cabot), a supply of raw materials, spare parts, and supplies adequate to permit CTI or Cabot to operate the plants for a period of six (6) months from the date of such termination or expiration;

(ii) NJZ shall make available for employment by CTI or Cabot a competent work force adequately trained and experienced to permit CTI or Cabot to operate the leased premises; and

(iii) NJZ shall assign or reassign to CTI or Cabot, and CTI or Cabot shall assume such contracts as CTI or Cabot shall deem necessary for operations planned by CTI or Cabot at the leased premises. NJZ shall specify to CTI and Cabot, on or before January 5 of the year of termination or expiration, all contracts affecting the leased premises, and Cabot or CTI shall specify to NJZ, on or before March 1, of said year, those contracts which Cabot or CTI wishes to assume as provided above.

(b) In the event the Lease is terminated by NJZ due to default by Lessors under Article VIII thereof, then in addition to any other agreements contained in the Lease, the License or herein (except those contained in paragraph 10(a) hereof):

- (i) CTI or Cabot shall purchase all inventories from NJZ at book value, and shall pay for the various categories thereof upon substantially the same terms as the same were paid for by NJZ hereunder; and
- (ii) NJZ will make available for employment by CTI or Cabot a competent work force adequately trained and experienced to permit CTI or Cabot to operate the leased premises; and
- (iii) NJZ shall reassign and CTI or Cabot shall assume all contracts included in the Assets, and NJZ shall assign and CTI or Cabot shall assume all contracts affecting the leased premises made by NJZ after the date hereof and prior to such termination of the Lease and consented to by CTI or Cabot, which consent shall not be unreasonably withheld; and
- (iv) CTI or Cabot shall reimburse NJZ all operating losses incurred by NJZ in conducting its business at the leased premises as determined in accordance with generally accepted accounting principles consistently applied and as audited by CTI or Cabot; and
- (v) CTI or Cabot shall indemnify NJZ and hold NJZ harmless against all claims arising from NJZ's operations at the leased premises not arising in whole or part from the negligence or willful misconduct of NJZ, its employees or agents.

11. Property Taxes.

All federal, state and local personal property, excise and other taxes (exclusive of income and franchise taxes and not including real property taxes covered by the terms of the Lease)

payable with respect to the Assets for any period after the date hereof, shall be at the expense of NJZ, and any such amounts billed to and paid by CTI shall be reimbursed by NJZ to CTI within ten (10) days of receipt of notice of payment from CTI; it being understood that all State of Ohio personal property taxes payable in calendar 1972 shall be deemed to be assessed for calendar 1972 and prorated accordingly as of the date hereof, and that all such taxes on inventories paid by CTI in calendar 1973 shall be reimbursed in full to CTI by NJZ.

12. Closing Taxes.

(a) NJZ shall pay all sales and use taxes, if any, payable in connection with the transfers contemplated herein and deliver to CTI when obtained by NJZ a State of Ohio blanket sales tax exemption certificate and/or a State of Ohio direct payment permit.

(b) CTI shall pay all other transfer and documentary taxes, if any, payable in connection with the transfers contemplated herein.

13. Assumption of Liabilities.

(a) In addition to the assumptions of liability referred to in Sections 9(b), 11 and 12 hereof, NJZ hereby assumes and agrees to discharge or perform:

(i) All obligations of CTI or Cabot under all agreements included in the Assets and transferred and to be transferred hereunder, to the extent that such agreements are wholly or partially unperformed at the date hereof, except obligations to pay money thereunder for services performed prior to the

date hereof, and for products delivered prior to the date hereof and included in the Assets to the extent that the Book Value of the same is included in the purchase price payable hereunder; and

(ii) Except for those liabilities which CTI and Cabot have specifically assumed under paragraph (b) of this Section 13, all liabilities of CTI and Cabot for personal injury or property damage suffered on or after the date hereof and arising out of the use or operation of any of the Assets transferred hereunder or the leased property transferred under the Lease.

(b) CTI and Cabot shall retain and hereby agree to pay or discharge:

(i) All other liabilities and obligations of CTI or Cabot existing prior to the date hereof; and

(ii) Liabilities arising on or after the date hereof out of the sale of Finished  $\text{TiO}_2$  Inventory bagged prior to the date hereof not caused in whole or part by the acts or omissions of NJZ, its agents or employees; and

(iii) All liabilities of NJZ for personal injury or property damage suffered during the period beginning with the date hereof and ending ninety (90) days from the date hereof and arising out of conditions at the leased premises existing at the date hereof not created in whole or part by NJZ and which NJZ shall not have had a reasonable opportunity to correct; and

(iv) All liabilities of NJZ for fines (other than those fines specified in paragraph (v) below) assessed under

the Occupational Safety and Health Act of 1970 and the regulations thereunder ("OSHA") during the period beginning with the date hereof and ending ninety (90) days from the date hereof and arising out of conditions at the leased premises existing at the date hereof not created in whole or part by NJZ and which NJZ shall not have had a reasonable opportunity to correct; and (v) All liabilities of NJZ for fines assessed under OSHA for violations of noise or plant process emission standards during the period beginning with the date hereof and ending one hundred eighty (180) days from the date hereof and arising out of conditions at the leased premises existing at the date hereof not created in whole or part by NJZ and which NJZ shall not have had a reasonable opportunity to correct.

14. Indemnification and Insurance.

(a) The Sellers hereby agree to indemnify and hold NJZ harmless against all liabilities retained by the Sellers under Section 13(b) hereof.

(b) NJZ hereby agrees to indemnify and hold the Sellers harmless against all liabilities assumed by NJZ under Section 13(a) hereof.

(c) If any claim shall be asserted against any of the parties hereto in respect of which it proposes to demand indemnification, the other party or parties shall be notified of such claim with reasonable promptness after its assertion and the party or parties

so notified shall have the right to assume control of the defense, compromise or settlement of any such claim through its own attorney and at its own expense.

(d) The Sellers and NJZ shall each provide the other with an insurance certificate or certificates evidencing General Comprehensive Liability insurance covering the party or parties providing such certificate or certificates in the amount of at least Twenty Million Dollars (\$20,000,000) including without limitation provision for contractual indemnity, completed operations and products liability coverage.

(e) NJZ agrees that it will surrender to CTI or Cabot, as the case may be, promptly following execution hereof all registration plates of motor vehicles, whether leased or owned, transferred to NJZ, if surrender of such registration plates is a prerequisite to cancellation of the registration and/or automobile liability insurance policy pertaining to any such motor vehicle or vehicles.

(f) NJZ will at its own expense insure against loss or damage those assets included in the Assets with respect to which deferred payment is provided in Section 3 hereof at higher of their cost or full replacement value under an insurance policy or policies naming CTI as additional loss payee, and all insurance proceeds arising from damage to or destruction of any of said assets shall be paid to CTI, in full or partial satisfaction, as the case may be, of NJZ's obligation to make deferred payments hereunder with respect to the said assets so damaged or destroyed.

(g) NJZ will reimburse CTI for the advance deposit premium of Nine Thousand Seven Hundred Eighty-one Dollars (\$9,781) presently maintained by CTI with the State of Ohio Bureau of Workmen's Compensation and to be transferred by CTI to NJZ together with CTI's workmen's compensation accounting records.

15. Representation and Warranties.

(a) The Sellers hereby represent and warrant to NJZ as follows:

(i) CTI is a corporation duly organized, validly existing and in good standing under the laws of the State of Delaware; has corporate power to carry on its business as it is now being conducted; is duly qualified to do business and is in good standing in each jurisdiction in which the character and location of the Assets or the nature of the business transacted by it makes such qualification necessary; the execution, delivery and performance of this Agreement on the part of CTI have been duly and effectively authorized by all requisite corporate action and will not violate or breach any agreement or law by which CTI is bound or subject.

(ii) Since May 22, 1972, there has not been any change in the financial condition, assets or business of CTI other than events or conditions occurring in the ordinary course of business, or any event or condition of any character which has materially and adversely affected the CTI business.

(iii) All of the Assets transferred hereby are free and clear of all liens and encumbrances, other than the lien of taxes not yet due and payable and imperfections of title and encumbrances, if any, that do not materially detract from the value or otherwise materially impair business operations; and CTI has received no notice, except as has been disclosed to NJZ in writing prior to the

execution hereof, of violation of any applicable zoning regulation, ordinance or other law, order, regulation or requirement relating to any of the Assets or the business of CTI.

(iv) Except as to matters disclosed to NJZ in Exhibit D hereof, there is no litigation, proceeding or governmental investigation pending or threatened against or relating to the business of CTI or the Assets or the transactions contemplated by this Agreement which may result in any material adverse change in the business of CTI to be transferred hereunder and under the Lease and the License.

(v) Neither CTI nor Cabot is in default with respect to any obligations to be performed by either of them under any agreement listed in Exhibit A hereof, nor has there occurred any event which, with notice or passage of time or both, could become a default thereunder; and to the best of the knowledge of the Sellers no other party to any such agreement is in default thereunder.

(b) NJZ hereby represents and warrants that it is a corporation duly organized, validly existing and in good standing under the laws of the State of Delaware; that it is duly qualified to do business and is in good standing in each jurisdiction in which the nature of the business transacted by it and to be transacted by it following acquisition of the Assets makes such qualification necessary; and that the execution, delivery and performance of this

Agreement on the part of NJZ have been duly and effectively authorized by all requisite corporate action and will not violate or breach any agreement or law by which NJZ is bound or subject.

16. Documents to be Delivered.

(a) The Sellers shall deliver to NJZ at the time of execution hereof, in form satisfactory to counsel for NJZ:

- (i) The Lease (to be executed simultaneously herewith); and
- (ii) The License (to be executed simultaneously herewith); and
- (iii) An opinion of counsel for CTI and Cabot, to the effect that:

(A) Cabot and CTI are validly incorporated in the State of Delaware and qualified to do business in all states which the nature of their business requires; and

(B) All requisite corporate proceedings of CTI and Cabot have been taken to authorize the execution, delivery and performance of this Agreement, the Lease and the License; this Agreement, the Lease and the License have been duly executed and delivered; such Agreement, Lease and License are valid and binding in accordance with their terms, and validly and effectively execute the transfers and transactions thereby contemplated; and

(C) He does not know of any litigation, proceeding or governmental investigation, save as disclosed to NJZ in Exhibit D hereof, pending or threatened

against or relating to the business of CTI or the Assets or the transaction contemplated by this Agreement, which can reasonably be expected to result in any material adverse change in the business of CTI to be transferred hereunder and under the Lease and the License.

(b) NJZ shall deliver to the Sellers at the time of execution hereof, in form satisfactory to counsel for CTI, an opinion of NJZ's counsel to the effect that:

(i) NJZ is validly incorporated in the State of Delaware and qualified to do business in the State of Ohio;

(ii) All requisite corporate proceedings of NJZ have been taken to authorize the execution, delivery and performance of this Agreement, the Lease and the License by NJZ; this Agreement, the Lease and the License have been duly executed and delivered; such Agreement, Lease and License are valid and binding in accordance with their terms, and validly and effectively execute the transfers and transactions thereby contemplated.

(c) CTI and Cabot shall deliver to NJZ assignments of the agreements listed in Exhibit A hereto, either at the time of execution hereof or as soon thereafter as consents to the said assignments may be obtained.

17. Record Retention.

All records required to be made, and all documents required to be exchanged hereunder, under the Lease or under the License, shall be retained by the parties hereto and made available to each other during business hours for purposes of inspection and/or copying, for a period of five (5) years from the date hereof.

18. Brokerage

All negotiations relative to the Memorandum, this Agreement, the Lease and the License and the transactions contemplated in such agreements have been carried on directly between the Sellers and NJZ, without the intervention or assistance of any party not a party to the four said agreements. No party has any right or claim to any commission, brokerage fee or other compensation relative to any of the four said agreements or the transactions contemplated therein. NJZ shall defend Cabot and/or CTI against any and all claims that Cabot and/or CTI be liable to any party claiming to represent NJZ for any commission, brokerage fee or other compensation, or any part thereof, relative to the four said agreements or the transactions contemplated therein. The Sellers shall defend and indemnify NJZ against any and all claims that NJZ be liable to any party claiming to represent CTI and/or Cabot for any commission, brokerage fee or other compensation, or any part thereof, relative to the four said agreements or the transactions contemplated therein. Each party hereto shall pay all expenses incurred by it, including the fees of its counsel and accountants.

19. Miscellaneous.

(a) The Sellers agree that from time to time after the date hereof, at NJZ's request and without further consideration, Cabot or CTI will execute and deliver such other instruments of conveyance and transfer and take such other action as NJZ may require more effectively to convey, transfer to and vest in NJZ and to put NJZ in possession of, any of the Assets, business and property to be sold, conveyed, transferred and delivered hereunder.

(b) All representations and warranties by the parties hereto are made as of the date hereof and shall survive the execution hereof and any investigations made at any time with respect thereto.

(c) Any party hereto shall have the right to require arbitration of any dispute arising hereunder, under the rules of the American Arbitration Association.

(d) The provisions of this Agreement shall be construed and the provisions thereof shall be enforced, in accordance with the laws of the Commonwealth of Massachusetts.

(e) CTI shall not be required to comply with any so-called "Bulk Sales" laws of any jurisdiction and no warranty on the part of CTI contained herein or in any instrument delivered by CTI pursuant hereto shall be deemed to be broken by such failure to comply.

(f) This Agreement, the Lease and the License represent all terms of the agreement reached between the Sellers and NJZ with respect to the transfer to NJZ of the  $\text{TiO}_2$  and  $\text{TiCl}_4$  business heretofore conducted by CTI. These three agreements hereby supersede and cancel all other prior or contemporaneous agreements by and

between the parties thereto, and in particular the Memorandum of Agreement dated as of May 22, 1972. No evidence of any such prior or contemporaneous agreement, oral or written, shall be admissible as evidence to vary or contradict the terms of this Agreement, the Lease and the License. In case of conflict between or inconsistency among the terms of this Agreement, the Lease and/or the License, the terms of this Agreement shall prevail over those contained in the Lease and the License, and the terms of the Lease shall prevail over the License.

(g) All notices or other documents required or permitted to be given hereunder shall be in writing and shall be deemed to have been duly made if mailed by registered or certified mail, postage prepaid, return receipt requested, addressed:

(i) if to the Sellers, to

Cabot Corporation  
125 High Street  
Boston, Massachusetts 02110

Attention: Secretary

(ii) if to NJZ, to

The New Jersey Zinc Company  
2045 City Line Road  
Bethlehem, Pennsylvania 18017

Attention: Secretary

(h) If Cabot should at any time during the initial term of the Lease decide to consider changing its presently existing major source of supply for silicon tetrachloride ("SiCl<sub>4</sub>"), it will provide NJZ with a reasonable opportunity to negotiate with Cabot regarding an agreement to supply SiCl<sub>4</sub> to Cabot on mutually satisfactory terms; provided, however, that nothing herein contained

shall be deemed to limit Cabot's right to continue, initiate, carry on, or conclude, whether by reaching agreement or otherwise, negotiations for the supply of  $\text{SiCl}_4$  with any other party or parties during the period of its negotiations with NJZ.

(i) This Agreement may not be assigned by the Sellers without the prior written consent of NJZ, nor by NJZ without the prior written consent of the Sellers. The terms of this Agreement shall be binding upon and shall inure to the benefit of the successors of each of the parties hereto.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be duly executed as of the date first written above.

ATTEST:

By W. D. McBain  
Secretary

THE NEW JERSEY ZINC COMPANY

By Alfred J. Zerk  
Chairman

ATTEST:

By Walter F. Greeley  
Secretary

CABOT TITANIA, INC.

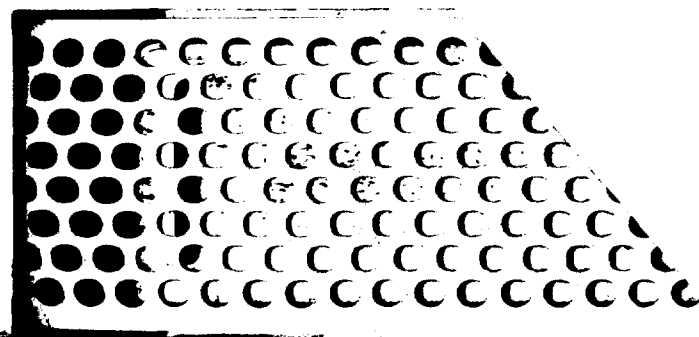
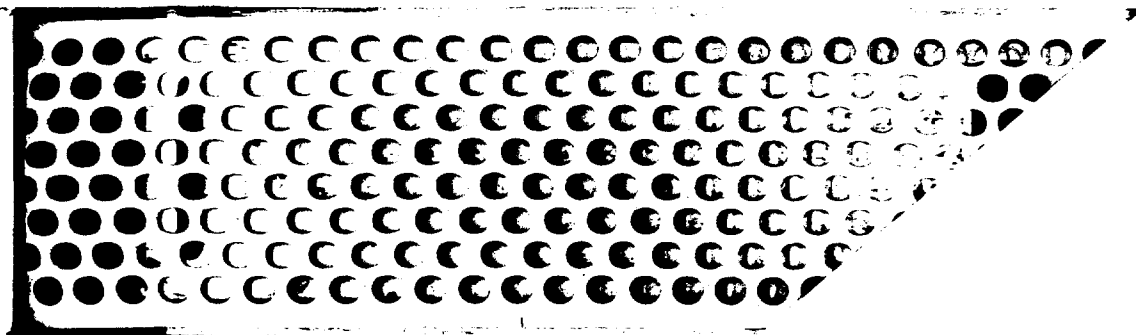
By Robert G. Chapin *RM*  
Vice President

ATTEST:

By Walter F. Greeley  
Secretary

CABOT CORPORATION

By Robert G. Chapin *RM*  
President



BY *Richard G. L...*  
CABOT CORPORATION  
President  
BY *Richard G. L...*  
CABOT TITANIA, INC.  
President  
BY *John J. ...*  
CHAIRMAN  
NEW JERSEY ZINC COMPANY

Used this  
set written above.

used this  
st written above.

NEW JERSEY ZINC COMPANY

Chairman

CABOT TITANIA, INC.

BY

CABOT CORPORATION

BY

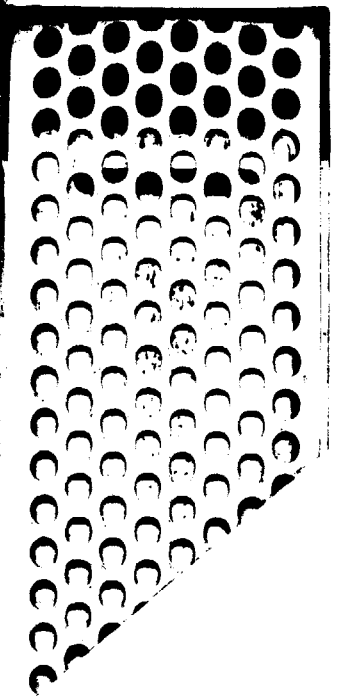
President

KW

President

KW

Copy



BY Harry H. Hughes President  
CABOT CORPORATION  
BY Harry H. Hughes President  
CABOT TITANIA, INC.  
BY Harry H. Hughes President  
NEW JERSEY ZINC COMPANY

used this  
st written above.

Harry H. Hughes

Exhibit C

BILL OF SALE

KNOW ALL MEN BY THESE PRESENTS that CABOT TITANIA, INC., a Delaware corporation ("CTI") for and in consideration of Ten Dollars (\$10.00) and other good and valuable consideration, receipt whereof is hereby acknowledged has sold, assigned, transferred and set over and by these presents does hereby grant, bargain, sell, assign, transfer and set over unto THE NEW JERSEY ZINC COMPANY, a division of Gulf & Western Industries, Inc., a Delaware corporation ("NJZ"), all of its right, title and interest in and to all raw materials, spare parts, portable tools, portable equipment, automotive equipment, office equipment and files, operating records, and all other personal property now located on, in or about the premises of that certain titanium tetrachloride plant at Ashtabula, Ohio heretofore conveyed by CTI to NJZ, which items of personal property hereby sold shall include, but not be limited to, those items of personal property described in Schedule A, attached hereto and made a part hereof.

And CTI for itself, its successors and assigns, does hereby warrant to NJZ, its successors and assigns, that CTI has not heretofore conveyed or transferred any interest in any of the above-described personal property to anyone other than NJZ, and that as of the date hereof said personal property is owned by CTI free from all liens and encumbrances of every nature whatsoever.

IN WITNESS WHEREOF, CTI has caused this Bill of Sale to be executed as of the First day of June, 1975, by its officers thereunto duly authorized.

CABOT TITANIA, INC.

By [Signature]  
President

By Walter F. [Signature]  
Secretary

WITNESSES:

Mary E. [Signature]

Arthur [Signature]

STATE OF Massachusetts )  
COUNTY OF Suffolk ) ss.

Before me, a notary public in and for said county, personally appeared [Signature] and [Signature] to me known and known to me to be the persons who, as president and Secretary, respectively, of Cabot Titania, Inc., the corporation which executed the foregoing instrument, signed the same and acknowledged to me that they did so sign said instrument in the name and on behalf of said corporation as such officers, respectively; that the same is their free act and deed as such officers, respectively, and the free and corporate act and deed of said corporation; that they were duly authorized thereunto by its board of directors; and that the seal affixed to said instrument is the corporate seal of said corporation.

In testimony whereof I have hereunto subscribed my name and affixed my official seal at [Signature], this 1st day of June, 1975.

[Signature]  
Notary Public

ATTESTING WITNESSES:

[Signature]  
[Signature]

BILL OF SALE

SCHEDULE A

The listings attached hereto marked "TiCl<sub>4</sub> Plant" and "TiO<sub>2</sub> Plant" dated 5/19/75 with items purchased by NJZ since June 1, 1972 initialed "NJZ", together with all miscellaneous office furniture and fixtures, office and laboratory equipment located at the plant sites in Ashtabula Township, Ohio.

PLANT ASSETS REGISTER  
5/19/75

11 U14 Plant

IT AREA	EQUIP NBR	DESCRIPTION	DATE TO PP&E	CONTRACTOR NBR	PROJ NBR	PD NBR	EQUIPMENT SUPPLIER	NOTES
***** CHLORINATION -CONDENSATION								
0	01	CB-404	SPRAY DRYER VENT STACK	4/70	CT740			
0	01	DA-201A	SPRAY DRYER DWG. 335 R & C	10/64	LUMMUS	5094	302	BUFFALO TANK DIVISION
0	01	DA-201B	SPRAY DRYER DWG. 335 R & C	10/64	LUMMUS	5094	302	BUFFALO TANK DIVISION
0	01	DA-201C	SPRAY DRYER DWG. 335 R & C	10/64	LUMMUS	5094	302	BUFFALO TANK DIVISION
0	01	DA-201D	SPRAY DRYER C/O TROMBOLD EQUIPMENT CO.	9/67		CT219	13686	RICHMOND ENGINEERING CO.
0	01	DA-201E	SPRAY DRYERS C/O TROMBOLD EQUIPMENT CO.	9/67		CT219	13686	RICHMOND ENGINEERING CO.
0	01	DA-422A	1ST STAGE T1CL4 CONDENSER	9/67		CT219	13763	THE THORNTON CO.
0	01	DA-422B	1ST STAGE T1CL4 CONDENSER	9/67		CT219	13763	THE THORNTON CO.
0	01	DA-423A	2ND STAGE T1CL4 CONDENSER	9/67		CT219	13763	THE THORNTON CO.
0	01	DA-423B	2ND STAGE T1CL4 CONDENSER	9/67		CT219	13763	THE THORNTON CO.
0	01	DA-424A	3RD STAGE T1CL4 CONDENSER	9/67		CT219	13763	THE THORNTON CO.
0	01	DA-424B	3RD STAGE T1CL4 CONDENSER	9/67		CT219	13763	THE THORNTON CO.
0	01	DA-426A	3RD STAGE DEMISTER	9/67		CT219	15288	CENTRIFIX CORP.
0	01	DA-426B	3RD STAGE DEMISTER	9/67		CT219	15288	CENTRIFIX CORP.
0	01	DC-201A	REACTOR	10/64	LUMMUS	5094	302	BUFFALO TANK DIV.
0	01	DC-201B	REACTOR	10/64	LUMMUS	5094	302	BUFFALO TANK DIV.
0	01	DC-201C	REACTOR	10/64	LUMMUS	5094	302	BUFFALO TANK DIV.
0	01	DC-201D	REACTOR C/O TROMBOLD EQ. CO.	9/67		CT219	13686	RICHMOND ENG. CO.
0	01	DC-201E	REACTOR C/O TROMBOLD EQUIP. CO.	9/67		CT219	13686	RICHMOND ENG. CO.
0	01	EA-422A	1ST STAGE RECIRCULATION COOLERS	9/67		CT219	15371	BROWN FIN TUBE CO.
0	01	EA-422B	1ST STAGE RECIRCULATION COOLERS	9/67		CT219	15371	BROWN FIN TUBE CO.
0	01	EA-423A	2ND STAGE RECIRC. COOLERS	9/67		CT219	15371	BROWN FIN TUBE CO.
0	01	EA-423B	2ND STAGE RECIRC. COOLERS	9/67		CT219	15371	BROWN FIN TUBE CO.
0	01	EA-424A	3RD STAGE RECIRC. COOLERS	9/67		CT219	15370	DOYLE & ROTH MFG. CO.
0	01	EA-424B	3RD STAGE RECIRC. COOLERS	9/67		CT219	15370	DOYLE & ROTH MFG. CO.
0	01	EA-451	VENT CONDENSER FOR FA447 WAS EA200 -	8/63	STAUFFER	233		IDL
0	01	FA-421	SPRAY DRYER RECIRC. TANK	9/67		CT219	14815	ADAMSON CO., INC.
0	01	FA-422A	1ST STAGE RECIRCULATION TANK	9/67		CT219	15819	BUFFALO TANK
0	01	FA-422B	1ST STAGE RECIRCULATION TANK	9/67		CT219	15819	BUFFALO TANK
0	01	FA-423A	2ND STAGE RECIRCULATION TANK	9/67		CT219	15819	BUFFALO TANK
0	01	FA-423B	2ND STAGE RECIRCULATION TANK	9/67		CT219	15819	BUFFALO TANK
0	01	FA-424A	3RD STAGE RECIRCULATION TANK	9/67		CT219	14815	ADAMSON CO., INC.
0	01	FA-424B	3RD STAGE RECIRCULATION TANK	9/67		CT219	14815	ADAMSON CO., INC.
0	01	FA-447	CRUDE T1CL4 STORAGE TANK	10/67		CT524	26582	SHARPSVILLE TANK
0	01	FC-421A	CYCLONE FOR FA-421 TANK	7/73		CT014		INDUSTRIAL PUMP & EQUIP
0	01	FC-421B	CYCLONE FOR FA-421 TANK	7/74		CT020		INDUSTRIAL PUMP & EQUIP
0	01	FC-902	REACTOR CYCLONE-E REACTOR	11/66		7005	23448	GAS MACHINERY CO. IDL
0	01	FD-403A	T1CL4 SEAL FILTERS TO REC. PUMPS	9/67		CT219	24042	CUNO
0	01	FD-408B	T1CL4 SEAL FILTERS TO REC. PUMPS	9/67		CT219	24042	CUNO
0	01	GA-421A	SPRAY DRYER CIRC. PUMP	10/68		CT624	31696	WILFLEY & SONS, INC.
0	01	GA-421B	SPRAY DRYER CIRC. PUMP	10/68		CT624	31696	WILFLEY & SONS, INC.

PLANT ASSETS REGISTER  
5/19/75

UNIT AREA	EQUIP NBR	DESCRIPTION	DATE TO PP&E	CONTRACTOR NBR	PROJ NBR	PD NBR	EQUIPMENT SUPPLIER	NOTES
0	01	GA-421S	SPRAY DRYER CIRC. PUMP	10/68	CT624	31696	WILFLEY & SONS, INC.	
0	01	GA-422A	1ST STAGE RECIRCULATION PUMP	10/68	CT624	31696	WILFLEY & SONS, INC.	
0	01	GA-422B	1ST STAGE RECIRCULATION PUMP	10/68	CT624	31696	WILFLEY & SONS, INC.	
		SEE W.O. 7018						
0	01	<del>GA-422B</del>	<del>1ST STAGE RECIRCULATION PUMP</del>	<del>10/68</del>	<del>CT624</del>	<del>31696</del>	<del>WILFLEY &amp; SONS, INC.</del>	
0	01	GA-422S	1ST STAGE RECIRCULATION PUMP	7/67	CT596	7018	WILFLEY & SONS, INC.	
0	01	GA-423A	2ND STAGE RECIRCULATING PUMP	9/67	CT219	14530	TELCO, INC.	
0	01	GA-423S	2ND STAGE RECIRCULATING PUMP	9/67	CT219	14530	TELCO, INC.	
0	01	GA-423B	2ND STAGE RECIRCULATING PUMP	9/67	CT219	14530	TELCO, INC.	
0	01	GA-423S	2ND STAGE RECIRCULATING PUMP	9/67	CT219	14530	TELCO, INC.	
0	01	GA-424A	3RD STAGE RECIRCULATING PUMP	9/67	CT219	14530	TELCO, INC.	
0	01	GA-424S	3RD STAGE RECIRCULATING PUMP	9/67	CT219	14530	TELCO, INC.	
0	01	GA-426A	CRUDE TICL4 PUMP TO OIL TREATER	9/67	CT219	14530	TELCO, INC.	
0	01	GA-426S	CRUDE TICL4 PUMP TO OIL TREATER	9/67	CT219	14530	TELCO, INC.	
0	01	GB-406A	CHLORINATION OFF GAS BOOSTER BLOWER	10/64	CT100	3490	BUFFALO FORGE	
0	01	GB-406B	CHLORINATION OFF GAS BOOSTER BLOWER	10/64	CT100	3490	BUFFALO FORGE	
0	01	GB-415A	START-UP AIR BLOWER	7/65	CT258	7716	GARDNER-DENVER	
0	01	GB-415B	START-UP AIR BLOWER	7/65	CT258	7716	GARDNER-DENVER	
0	01	GB-415C	START-UP AIR BLOWER	9/67	CT219	13993	GARDNER-DENVER	
0	01	GB-415D	START-UP AIR BLOWER	9/67	CT219	13993	GARDNER-DENVER	
0	01	GB-427A	PROCESS OFF GAS BLOWER	9/67	CT219	15570	BUFFALO FORGE	
0	01	GB-427B	PROCESS OFF GAS BLOWER	9/67	CT219	15570	BUFFALO FORGE	
0	01	GB-427S	PROCESS OFF GAS BLOWER	9/67	CT219	15570	BUFFALO FORGE	
0	01	GB-449	ROOF VENTILATOR FAN TICL4 REACTOR BLDG.	7/70	CT732		A. R. SAUTERS	
0	01	GD-421	SPRAY DRYER REC. TANK AGITATOR	9/67	CT219	14831	PHILA. GEAR C/O WHITE IN	
0	01	GD-422A	1ST STAGE REC. TANK AGITATOR	9/67	CT219	14831	PHILA. GEAR C/O WHITE IN	
0	01	GD-422B	1ST STAGE REC. TANK AGITATOR	9/67	CT219	14831	PHILA. GEAR C/O WHITE IN	
0	01	GD-423A	2ND STAGE REC. TANK AGITATOR	9/67	CT219	14831	PHILADELPHIA GEAR	
0	01	GD-423B	2ND STAGE REC. TANK AGITATOR	9/67	CT219	14831	PHILADELPHIA GEAR	
0	01	GD-424A	3RD STAGE REC. TANK AGITATOR	9/67	CT219	14831	PHILADELPHIA GEAR	
0	01	GD-424B	3RD STAGE REC. TANK AGITATOR	9/67	CT219	14831	PHILADELPHIA GEAR	
0	01	GD-451	AGITATOR FOR CRUDE TICL4 TANK	10/67	CT524	25437	MIXING EQUIPMENT CO.	
0	01	PA-410A	ROTARY LOCKS UNDER DA-201A	10/64	CT183		VILLE PLATTE-CABOT	
0	01	PA-410B	ROTARY LOCKS UNDER DA-201B	11/64	CT184		VILLE PLATTE-CABOT	
0	01	PA-410C	ROTARY LOCKS UNDER DA201C	11/64	CT185		VILLE PLATTE-CABOT	
0	01	PA-410D	ROTARY LOCKS UNDER DA201D/E	9/67	CT219		VILLE PLATTE-CABOT	
0	01	PA-410E	ROTARY LOCKS UNDER DA201D/E	9/67	CT219		VILLE PLATTE-CABOT	
0	01	PA-444A	SYNTRON ROTARY VIBRATOR FOR DA201A	10/67	CT586		SYNTRON	
0	01	PA-444B	SYNTRON ROTARY VIBRATOR FOR DA201B	2/67	CT586		SYNTRON	
0	01	PA-444C	SYNTRON ROTARY VIBRATOR FOR DA201	10/67	CT586		SYNTRON	
0	01	PA-444D	SYNTRON ROTARY VIBRATOR FOR DA201	10/67	CT586		SYNTRON	
0	01	PA-444E	SYNTRON ROTARY VIBRATOR FOR DA201E	7/67	CT589		SYNTRON	
		SEE W.O. 7032						

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IT AREA	EQUIP NBR	DESCRIPTION	DATE TO PPCE	CONTRACTOR N3R	PROJ N3R	PO NBR	EQUIPMENT SUPPLIER	NOTES
***** PURIFICATION -DISTILLATION								
02	BA-201	THERMINOL HEATER	8/63	STAUFFER	233		STRUTHERS WELLS	
02	BA-402	THERMINOL HEATER	9/67		CT441	23693	STRUTHERS WELLS	
02	JA-403	STEAM HEATER FOR FB-457 <i>(see FB457)</i>	9/67		CT219	24101	BROWN FINTUBE	
02	DA-206	STRIPPER	10/64	LUMMUS	5094	304	COLONIAL IRON WORKS CO.	
02	DA-207	1ST STAGE ENRICHING TOWER	8/63	STAUFFER	233	2053	COLONIAL IRON WORKS CO.	
02	DA-208	2ND STAGE ENRICHING TOWER	8/63	STAUFFER	233	2053	COLONIAL IRON WORKS CO.	
02	DA-301	TICL4 RECTIFIER	10/64	LUMMUS	5246	302	BUFFALO TANK DIVISION	
02	EA-208C	CRUDE TICL4 CONDENSER	9/67		CT219	18419	INDUSTRIAL PROCESS ENG.	
02	EA-208D	CRUDE TICL4 CONDENSER	9/67		CT219	13787	INDUSTRIAL PROCESS ENG.	
02	EA-208E	CRUDE TICL4 CONDENSER	9/67		CT219	19802	INDUSTRIAL PROCESS ENG.	
02	EA-208F	CRUDE TICL4 CONDENSER	9/67		CT219	22284	INDUSTRIAL PROCESS ENG.	
02	EA-208G	CRUDE TICL4 CONDENSER	10/64	LUMMUS	5094		LUMMUS	
02	EA-208H	CRUDE TICL4 CONDENSER	10/64	LUMMUS	5094		LUMMUS	
02	EA-209A	STRIPPER OVERHEAD CONDENSER	10/64	LUMMUS	5094	40102	INDUSTRIAL PROCESS ENG.	
02	EA-209S	STRIPPER OVERHEAD CONDENSER	3/66		CT370		INDUSTRIAL PROCESS ENG.	
02	EA-210	STRIPPER REBOILER	10/64	LUMMUS	5094	40102	INDUSTRIAL PROCESS ENG.	
02	EA-212	1ST STAGE ENRICHING TOWER REBOILER	8/63	STAUFFER	233	2103	PFAUDLER CO.	
02	EA-213	2ND STAGE ENRICH TOWER COND.	8/63	STAUFFER	233	2103	PFAUDLER CO.	
02	EA-214	2ND STAGE ENRICH. TOWER VENT CONDENSER	8/63	STAUFFER	233	2103	PFAUDLER CO.	
02	EA-302	TICL4 RECTIFIER BOILER	12/64	LUMMUS	5246	400	INDUSTRIAL PROCESS ENGR.	
02	EA-302S	TICL4 REBOILER	1/66		CT290	14912	INDUSTRIAL PROCESS ENGR.	
02	EA-413	PROCESS VENT GAS COOLER	8/63				FROM BILLERICA	
02	EA-436	CRUDE TICL4 PREHEATER FOR OIL TREATER	9/67		CT219	23231	BROWN FINTUBE CO.	
02	EA-437	TICL4 BACKUP CONDENSER H2O	10/64	LUMMUS	5094	401		
02	EA-438	WAS EA203A - CT 219 TICL4 BACKUP CONDENSER BRINE	10/64	LUMMUS	5094	401		
02	EA-442	WAS EA203B - CT 219 TICL4 PRODUCT INTERCHANGER	4/74		05013	12893	BROWN FINTUBE	
02	EA-452A	TICL4 REFLUX CONDENSER	12/64		CT026	2565	STRUTHER WELLS-BLG BOILR	
02	EA-452S	WAS EA401 - CT 640 TICL4 REFLUX CONDENSER	12/64		CT026	2565	STRUTHER WELLS-BLG BOILR	
02	EA-452S	WAS EA401S - CT 640						
02	FA-208C	OIL TREATER	10/64	LUMMUS	5094	301	QUAKER CITY IRON WORKS	
02	FA-208D	OIL TREATER	10/64	LUMMUS	5094	301	QUAKER CITY IRON WORKS	
02	FA-208E	OIL TREATER	9/67		CT219	13740	QUAKER CITY IRON WORKS	
02	FA-208F	OIL TREATER	9/67		CT219	18338	QUAKER CITY IRON WORKS	
02	FA-208G	OIL TREATER	9/67		CT219	19763	QUAKER CITY IRON WORKS	
02	FA-208H	OIL TREATER	9/67		CT219	22406	QUAKER CITY IRON WORKS	
02	FA-211	SURGE DRUM	8/63	STAUFFER	233	2087	W. E. CALDWELL	
02	FA-212	REFLUX DRUM FOR DA207 <i>(see DA207)</i>	8/63	STAUFFER	233	2087	W. E. CALDWELL	
02	FA-218A	OIL TREATER KNUCKOUT POT-DEMISTER <i>(see FA218A)</i>	10/64	LUMMUS	5094	307	BUFFALO TANK DIV.	
02	FA-218B	OIL TREATER KNUCKOUT POT-DEMISTER <i>(see FA218B)</i>	10/64	LUMMUS	5094	307	BUFFALO TANK DIV.	
02	FA-218C	OIL TREATER KO POT SEPARATR-DEMISTER <i>(see FA218C)</i>	9/67		CT219	13760	BUFFALO TANK DIVISION	
02	FA-218D	OIL TREATER KO POT SEPARATOR-DEMISTER <i>(see FA218D)</i>	9/67		CT219	18220	BUFFALO TANK DIV.	
02	FA-218E	OIL TREATER KNOCK OUT POT-DEMISTER <i>(see FA218E)</i>	9/67		CT219	19801	BUFFALO TANK DIV.	
02	FA-218F	OIL TREATER KNOCK OUT POT-DEMISTER <i>(see FA218F)</i>	9/67		CT219	22296	BUFFALO TANK DIV.	
02	FA-219	STRIPPER FEED TANK	10/64	LUMMUS	5094	307	BUFFALO TANK DIV.	
02	FA-307	REFLUX DRUM	12/64	LUMMUS	5246	302	BUFFALO TANK	
02	FA-448	KNUCKOUT POT OIL TREATER VENT-DEMISTER	9/67		CT219	26310	BUFFALO TANK DIVISION	

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IT AREA	EQUIP NBR	DESCRIPTION	DATE TO PPEE	CONTRACTOR	PROJ NBR	PO NBR	EQUIPMENT SUPPLIER	NOTES
0	02	EA-505	HEAD TANK FOR GA-530 PUMP	8/73	NJ2 05013		E & W SERVICES	
0	02	FB-201	CHECK TANK	8/63	STAUFFER	233	2024	BUFFALO TANK
1	02	FB-202	CHECK TANK	8/63	STAUFFER	233	2024	BUFFALO TANK
0	02	FB-457	OIL STORAGE TK-5000GAL. FORMR. FA203	8/63	STAUFFER	233	2091	BUFFALO TANK
		MODIFIED BY CT-219 09/67						
0	02	FB-450	THERMINOL STORAGE TANK WITH BA-402	9/67		CT441	23693	STRUTHERS WELLS
0	02	FB-459	EXPANSION TANK WITH BA-402	9/67		CT441	23693	STRUTHERS WELLS
0	02	FD-301	TICL4 RECTIFIER LINE SEPARATOR	12/64	LUMMUS	5246	303	PEERLESS
0	02	FD-409A	OIL FILTER AT FB-457	9/67		CT219	18315	CUNO
0	02	GA-207A	SURGE PUMP FOR FA-211	8/63				CHEMPUMP
0	02	GA-208A	REFLUX PUMP	8/63				CHEMPUMP
0	02	GA-217	STRIPPER BOTTOMS RETURN PUMP	10/64	LUMMUS	5094	502	CHEMPUMP
0	02	GA-219A	THERMINOL CIRCULATING PUMP	8/63	STAUFFER	233		
0	02	GA-219B	THERMINOL CIRCULATING PUMP	8/63	STAUFFER	233		
0	02	GA-427	STRIPPER FEED PUMP	3/67		CT557	15283	TELCO, INC.
0	02	GA-457	OIL PUMP TO OIL TREATERS	9/67		CT219	25404	GEO. P. SCHUMACKER CO.
0	02	GA-461A	THERMINOL MAIN CIRC. PUMPS	9/67		CT441	23693	STRUTHERS WELLS
0	02	GA-461S	THERMINOL MAIN CIRC. PUMPS	9/67		CT441	23693	STRUTHERS WELLS
0	02	GA-462	THERMINOL TRANSFER PUMP	9/67		CT441	23693	STRUTHERS WELLS
0	02	GA-463	STRIPPER FEED PUMP FORM. GA-421S	9/67		CT219	15163	DURCO
0	02	GA-476	DA-301 BOTTOMS PUMP	8/66		CT470		CHEMPUMP
		SEE W08021						
0	02	GA-477	CANNED PUMP REPLACES GA-209A	9/67		CT219		CHEMPMP
0	02	GA-478A	PRODUCT PUMP TO PURE TANKS	8/67		CT507		CHEMPUMP DUPL. OF GA-20
0	02	GA-473S	PRODUCT PUMP TO PURE TANKS	8/67		CT507		CHEMPUMP DUPL. OF GA-20
0	02	GA-491A	HORIZONTAL CHECK TANK PUMPS	3/70		CT760	3047	DURCO TELCO, INC.
0	02	GA-491S	HORIZONTAL CHECK TANK PUMPS	3/70		CT760	3047	DURCO TELCO, INC.
0	02	GA-530	PURE TICL4 PUMP	3/74	NJ2 05013			DURIRON COMPANY
0	02	GB-434	PURGE BLOWER FOR BA-402	9/67		CT441	23693	BUFFALO FORGE CO.
0	02	GD-208C	AGITATOR SCRAPER FOR FA-208C/D	10/64	LUMMUS	5094	500	CHEMINEER
0	02	GD-208D	AGITATOR SCRAPER FOR FA-208C/D	10/64	LUMMUS	5094	500	CHEMINEER
0	02	GD-208E	AGITATOR SCRAPER FA-208E,F,G,H	9/67		CT219	13761	CHEMINEER
0	02	GD-208F	AGITATOR SCRAPER FA-208E,F,G,H	9/67		CT219	13761	CHEMINEER
0	02	GD-208G	AGITATOR SCRAPER FA-208E,F,G,H	9/67		CT219	18192	CHEMINEER
0	02	GD-208H	AGITATOR SCRAPER FA-208E,F,G,H	9/67		CT219	18192	CHEMINEER
0	02	KA-429	STORAGE TANK FU-458 VENT DRYER	9/67		CT441	25983	W.A. HAMMON.D ORIERITE C

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UNIT AREA	EQUIP NBR	DESCRIPTION	DATE TO PP&E	CONTRACTOR	PROJ NBR	PO NBR	EQUIPMENT SUPPLIER	NOTES
<i>Auxiliary Facilities</i>								
*****UTILITY & CONTROL								
0	15	BF-103	BOILER ERIE SOUTH	8/63	STAUFFER	233	2020	UNION IRON WORKS
0	07	BG-112	CHEMICAL FEEDER CORROSION CONTROL	10/66	CT307	17907		BETZ LABORATORIES
0	07	BG-117	CHEMICAL FEEDER ALKALINITY CONTROL FORMERLY BG-105	10/66	CT307			MILTON ROY
0	04	EA-250A	INSTRUMENT AIR AFTERCOOLER <i>see GB250A</i>	8/63	STAUFFER	233		
0	04	EA-250B	INSTRUMENT AIR AFTERCOOLER <i>see GB250B</i>	8/63	STAUFFER	233		
0	04	EA-440	UTILITY COMPRESSOR AFTERCOOLER <i>GB-440 see G440</i>	8/63	STAUFFER	233	2080	
0	04	EA-444	AMMONIA EXCHANGER <i>see GC 201</i>	8/63	STAUFFER	233		
0	04	EA-445	BRINE COOLER <i>see GC 201</i>	8/63	STAUFFER	233		
0	04	EF-1	COOLING TOWER H2O	10/66	CT307	14833		FLUOR PRODUCTS CO.
0	04	FA-250	INSTRUMENT AIR RECEIVER TANK <i>see GB250</i>	8/63	STAUFFER	233		
0	04	FA-440	UTILITY COMP. RECEIVER	8/63	STAUFFER	233	2080	INGERSOLL RAND
0	04	FA-465	BLOW DOWN TANK <i>see GC 201</i>	8/63	STAUFFER	233	2186	RICHMOND ENGINEERING CO.
0	04	FA-466	B.F.W. MIX TANK	8/63	STAUFFER	233	2013	W.H. & L.D. BETZ
0	04	FA-467	FILTER TANK H2O TREATMENT	8/63	STAUFFER	233		STAUFFER CHEM. CO., SAN F
0	04	FA-468	FILTER TANK H2O TREATMENT	8/63	STAUFFER	233		STAUFFER CHEM. CO., SAN F
0	04	FA-469	BRINE TANK H2O TREATMENT	8/63	STAUFFER	233		STAUFFER CHEM. CO., SAN F
0	04	FB-303	H2SO4 STORAGE TANK	10/66	CT307	18146		NORTHERN BOILER CO.
0	04	FB-464	BRINE HOLD TANK <i>see GC 201</i>	8/63	STAUFFER	233		STAUFFER
0	04	FB-465	AMMONIA HOLD TANK <i>see GC 201</i>	8/63	STAUFFER	233		STAUFFER
0	04	FG-440	UTIL. COMP. INTAKE FILTER <i>see GB440</i>	8/63	STAUFFER	233	2030	INGERSOLL RAND
0	04	FG-465A	INTAKE FILTER FOR GB-250A	8/63	STAUFFER	233	2011	INGERSOLL RAND
0	04	FG-465B	INTAKE FILTER FOR GB-250B	8/63	STAUFFER	233	2011	INGERSOLL RAND
0	04	GA-428A	COOLING TOWER H2O PUMPS	10/66	CT307	17136		WORTHINGTON CORP.
0	04	GA-428S	COOLING TOWER H2O PUMPS	10/66	CT307	17136		WORTHINGTON CORP.
0	04	GA-434	ELECT. PULL BOX SUMP PUMP	9/67	CT219	17965		GOULD PUMPS
0	04	GA-469	CHROMATE PUMP BG-112	10/66	CT307	22245		PRECISION PUMP
0	04	GA-470	ACID PUMP BG-117	10/66	CT307	22245		PRECISION PUMP
0	04	GA-472	BOILER FEED PUMP	8/63	STAUFFER	233	2093	DEAN BROS. PUMP, INC.
0	04	GA-473	BOILER FEED PUMP	8/63	STAUFFER	233	2079	UNION STEAM PUMP
0	04	GA-474A	B.F.W. TRANSFER PUMP	8/63	STAUFFER	233	2021	HILLS-MCCANNA CO.
0	04	GA-474B	B.F.W. TRANSFER PUMP	8/63	STAUFFER	233	2021	HILLS-MCCANNA CO.
0	04	GB-250A	INST. AIR COMPRESSOR	8/63	STAUFFER	233	2011	INGERSOLL-RAND
0	04	GB-250B	INST. AIR COMPRESSOR	8/63	STAUFFER	233	2011	INGERSOLL-RAND
0	04	GB-431	COOLING TOWER FAN	10/66	CT307	14833		FLUOR
0	04	GB-440	UTIL. COMPRESSOR MAINT. BLDG. <i>see</i>	8/63	STAUFFER	233	2080	INGERSOLL RAND
0	04	GC-460	INSTRUMENT AIR COMPRESSOR	4/73	NJ2	05009	2686	SULLAIRE CORP.
0	04	GC-201A	NH3 REFRIGERATION SYSTEM	8/63	STAUFFER	233	2014	FRICK
0	04	GC-201B	NH3 REFRIGERATION SYSTEM	8/63	STAUFFER	233	2014	FRICK
0	04	GD-466	AGITATOR FOR FA-466	8/63	STAUFFER	233		LIGHTNIN
0	04	KA-250A	INST. AIR DRYERS FOR GB-250A <i>see GB250A</i>	8/63	STAUFFER	233		ANDERS
0	04	KA-250B	INST. AIR DRYERS FOR GB-250B <i>see GB250B</i>	8/63	STAUFFER	233		ANDERS
0	04	KA-431	VENT DRYER FOR FB-303	10/66	CT307			
0	04	KA-432	INSTRUMENT AIR DRYER	4/73	NJ2	05009	2686	SULLAIRE *GENERAL*

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LT AREA	EQUIP NBR	DESCRIPTION	DATE TO PP&E	CONTRACTOR	PROJ NBR	PO NBR	EQUIPMENT SUPPLIER	NOTES
*****RAW MATL. STORAGE HDLG.								
0	0	EA-201A	CHLORINE VAPORIZER	10/64	LUMMUS	5094	400	RICHARD M. ARMSTRONG
0	0	EA-201B	CHLORINE VAPORIZER	10/64	LUMMUS	5094	400	RICHARD M. ARMSTRONG
0	0	EA-201C	CHLORINE VAPORIZER	9/67		CT219	13746	RICHARD M. ARMSTRONG
0	0	EA-205A	SUPERHEATER CHLORINE	8/63	STAUFFER	233		
0	0	EA-205B	SUPERHEATER CHLORINE	9/67		CT219	15160	THE THORNTON CO.
0	0	FA-201	CHLORINE SEPARATOR REVAMP	8/63	STAUFFER	233	2738	CORNELL & UNDERHILL
0	0	FD-468	PARAFFIN OIL STORAGE TANK	1/70		CT678	8011	LAKE SHOE STEEL
0	0	FD-402A	CHLORINE FILTER	9/67		CT219	15159	TELCO, INC.
0	0	FD-402B	CHLORINE FILTER	9/67		CT219	15159	TELCO, INC.
0	0	FE-201A	RUTILE SILOS	8/63	STAUFFER	233	2034	AMER MARIETTA CONCRETE C
0	0	FE-201B	RUTILE SILOS	8/63	STAUFFER	233	2034	AMER MARIETTA CONCRETE C
0	0	FE-201C	COKE SILO	8/63	STAUFFER	233	2034	AMER MARIETTA CONCRETE C
0	0	FE-201D	COKE SILO	8/63	STAUFFER	233	2034	AMER MARIETTA CONCRETE C
0	0	FE-203A	RUTILE WEIGH BINS	8/63				
0	0	FE-203B	RUTILE WEIGH BINS	8/63				
0	0	FE-203C	COKE WEIGH BINS	8/63				
0	0	FE-203D	COKE WEIGH BINS	8/63				
0	0	FE-205A	REACTOR CHARGE WEIGH BINS	10/64	LUMMUS	5094	1031	JAMESBURY CORP. WB-20
0	0	FE-205B	REACTOR CHARGE WEIGH BINS	10/64	LUMMUS	5094	1031	JAMESBURY CORP. WB-20
0	0	FE-205C	REACTOR CHARGE WEIGH BINS	10/64	LUMMUS	5094	1031	JAMESBURY CORP. WB-20
0	0	FE-205D	WEIGH BINS	9/67		CT219	13745	ARTHUR LOUIS STEEL CO.
0	0	FE-205E	WEIGH BINS	9/67		CT219	13745	ARTHUR LOUIS STEEL CO.
0	0	FE-206A	REACTOR CHARGE HOLDUP BINS	8/63	STAUFFER	233	2101	BURNHAM B-20
0	0	FE-206B	REACTOR CHARGE HOLDUP BINS	8/63	STAUFFER	233	2101	BURNHAM B-20
0	0	FE-206C	REACTOR CHARGE HOLDUP BINS	8/63	STAUFFER	233	2101	BURNHAM B-20
0	0	FE-206D	FEED BINS	9/67		CT219	13745	ARTHUR LOUIS STEEL CO.
0	0	FE-206E	FEED BINS	9/67		CT219	13745	ARTHUR LOUIS STEEL CO.
0	0	FE-207A	EMERGENCY FEED BIN	8/63	STAUFFER	233	2172	N.Y. ENGINEERING BE-23
0	0	FE-207B	EMERGENCY FEED BIN	8/63	STAUFFER	233	2172	N.Y. ENGINEERING BE-23
0	0	FE-207C	EMERGENCY FEED BIN	10/64	LUMMUS	5094	1031	JAMESBURY CORP.
0	0	FE-207D	EMERGENCY FEED BIN	9/67		CT219	13745	ARTHUR LOUIS STEEL CO.
0	0	FE-207E	EMERGENCY FEED BIN	9/67		CT219	13745	ARTHUR LOUIS STEEL CO.
0	0	FE-208	TRACK UNLOADING HOPPER	10/64	LUMMUS	5094	1600	BARBER GREENE CO.
0	0	FE-209	UNLOADING FEED HOPPER	10/64	LUMMUS	5094		BARBER GREENE CO.
0	0	GA-436	PARAFFIN OIL FEED PUMP	1/70		CT678	7421	HUNTER-LEMPKE VIKING
0	0	GD-470	AGITATOR FOR FB-468	1/70		CT678	7334	PHILADELPHIA GEAR
0	0	JD-201	UNLOADING TRANSFER CONVEYOR	10/64	LUMMUS	5094	1600	BARBER GREENE CO.
0	0	JD-202	UNLOADING FEED CONVEYOR	10/64	LUMMUS	5094	1600	BARBER GREENE CO.
0	0	JD-203	UNLOADING ELEVATOR	8/63	STAUFFER	233	2038	SYCO. CORP.
0	0	JD-204	UNLOADING DISTRIB. CONVEYOR	8/63	STAUFFER	233	2038	SYCO. CORP.
0	0	JD-205	REACTOR FEED CONVEYOR	8/63	STAUFFER	233	2038	SYCO. CORP.
0	0	JD-206	REACTOR FEED ELEVATOR	8/63	STAUFFER	233	2038	SYCO. CORP.
0	0	JD-207A	REACTOR CHARGE CONVEYOR	8/63	STAUFFER	233	2038	SYCO. CORP.
0	0	JD-207B	REACTOR CHARGE CONVEYOR	9/67		CT219	16045	HIGLEY COMPANY
0	0	JD-208A	REACTOR SCREW FEEDER - DC201A	8/63	STAUFFER	233	2761	ACME INDUSTRIAL SCREW CS
0	0	JD-208B	REACTOR SCREW FEEDER - DC201B	8/63	STAUFFER	233	2761	ACME INDUSTRIAL SCREW CS
0	0	JD-208C	REACTOR SCREW FEEDER - DC201C	8/63	STAUFFER	233	2761	ACME INDUSTRIAL SCREW CS
0	0	JD-423D	FEED SCREW TO REACTOR DC-201D	9/67		CT219	15661	REEFE EQUIPMENT CO.
0	0	JD-423E	FEED SCREW TO REACTOR DC-201E	9/67		CT219	15661	REEFE EQUIPMENT CO.

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NIT AREA	EQUIP NBR	DESCRIPTION	DATE TO CONTRACTOR PP&E	PROJ NBR	PO NBR	EQUIPMENT SUPPLIER	NOTES
10	01	6 IN SCREW CONVEYOR FOR ENLARGED REACTR	6/73	0500H	8266	E&W SERVICE	
10	01	GIN. SIDE FEED SCREW FOR DC201B REACTOR	1/74	0500H	5056	E&W SERVICES 5057 J EGAN	

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JIT AREA	EQUIP NBR	DESCRIPTION	DATE TO PP&E	CONTRACTOR	PROJ NBR	PO NBR	EQUIPMENT SUPPLIER	NOTES
***** FINISHED PRODUCT STORAGE								
0	02	FB-203 PRODUCT STORAGE <i>Tank</i>	8/63	STAUFFER	233	2023	BUFFALO TANK	
0	02	FB-204 PRODUCT STORAGE "	8/63	STAUFFER	233	2023	BUFFALO TANK	
0	02	FB-205 PRODUCT STORAGE "	8/63	STAUFFER	233	2023	BUFFALO TANK	
0	02	FB-206 PRODUCT STORAGE "	8/63	STAUFFER	233	2023	BUFFALO TANK	
0	02	FB-460A PURE TICL4 STORAGE TANK	8/67		CT507	23622	PERRY EQUIPMENT	
0	02	FB-460B PURE TICL4 STORAGE TANK	8/67		CT507	23622	PERRY EQUIPMENT	
0	02	FB-460C PURE TICL4 STORAGE TANK	8/67		CT507	23622	PERRY EQUIPMENT	
0	02	FB-460D PURE TICL4 STORAGE TANK	8/67		CT507	23622	PERRY EQUIPMENT	
0	02	FB-460E PURE TICL4 STORAGE TANK	8/67		CT507	23622	PERRY EQUIPMENT	
0	02	FB-460F PURE TICL4 STORAGE TANK	8/67		CT507	23622	PERRY EQUIPMENT	
0	02	FB-460G PURE TICL4 STORAGE TANK	8/67		CT507	23622	PERRY EQUIPMENT	
0	02	FB-460H PURE TICL4 STORAGE TANK	8/67		CT507	23622	PERRY EQUIPMENT	
0	02	FG-250A PURE TICL4 FILTER	8/63	STAUFFER	233	2100	EMER PROD. CORP.	
0	02	FG-250B PURE TICL4 FILTER	8/63	STAUFFER	233	2100	EMER PROD. CORP.	
0	02	FG-251A TICL4 FILTER <del>FB</del>	8/63	STAUFFER	233	2100	EMER PROD. CORP.	
0	02	FG-251B TICL4 FILTER <del>FB</del>	8/63	STAUFFER	233	2100	EMER PROD. CORP.	
0	02	GA-211A TICL4 PRODUCT PUMP FB 203-204	10/64	LUMMUS	5094	50405	GOULD PUMP C/O MOONEY	
0	02	GA-211B TICL4 PRODUCT PUMP FB 203-204	10/64	LUMMUS	5094	50405	GOULD PUMP C/O MOONEY	
0	02	GA-212A TICL4 PRODUCT PUMP FB205-206	8/63	STAUFFER	233	2109	TABER PUMP	
0	02	GA-212B TICL4 PRODUCT PUMP FB205-206	8/63	STAUFFER	233	2109	TABER PUMP	
0	02	GA-417 PRODUCT PUMP-FB-460	8/67		CT507		DURIRON CO. TELCO	

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IT AREA	EQUIP NBR	DESCRIPTION	DATE TO PPLE	CONTRACTOR NBR	PROJ NBR	PO NBR	EQUIPMENT SUPPLIER	NOTES
***** WASTE DISPOSAL FACILITIES								
0	10	BG-118 CLARIFIER SYSTEM	10/67		CT519			
		CROSS REF, GD-448, GD-449A/B, GD-450, GA-468						
0	10	BG-119 180' THICKENER	5/72		CTR97	7605	EIMCO	
0	10	CA-403 T1CL4 PLANT STACK	9/68		CT613	386	HEIL PROCESS EQUIPMENT CO.	
0	10	DA-435 SPRAY TOWER T1CL4	4/73		05005	676	POLY CON	
0	10	DA-436 SCRUBBER T1CL4	4/73		05005	676	POLY CON	
0	10	DA-439 SPRAY DRIER VENT TUNNEL	6/74	NJ2	05018	5544	FIBERGLASS IND. PRODUCTS	
0	10	DZ-400 SEWER TREATMENT BASIN						
0	10	EA-463 FG-464 FILTER PRE-HEATER	8/73		05002		BROWN FINTUBE	
0	10	ES-201 DEAERATOR D-60 STAUFFER CO.	8/63	STAUFFER	233	2017	WORTHINGTON	
0	10	FA-464A RECEIVER TANKS FOR FILTER	10/67		CT519	24172	KOMLINE SANDERSON	
0	10	FA-464H RECEIVER TANKS FOR FILTER	10/67		CT519	24172	KOMLINE SANDERSON	
0	10	FA-464C RECEIVER TANKS FOR FILTER	11/72		05002	63	KOMLINE SANDERSON	
0	10	FA-464D RECEIVER TANKS FOR FILTER	11/72	NJ2	05002	63	KOMLINE SANDERSON	
0	10	FA-473 SLURRY TANK	1/70		CT673	6904	HEIL PROCESS	
0	10	FA-480 FLOCCULANT ADDITIVE FEED TANK 300 GAL.	11/69		CT750	9690	BETZ LAB., INC.	
0	10	FA-481 FLOCCULANT ADDITIVE TANK - 500 GAL.	11/69		CT750	9690	BETZ LAB., INC.	
0	10	FA-488 NEUTRALIZATION TANK WASTE WATR 2ND STAG			CT897	7943	EIMCO	
0	10	FA-489 FLOC. MIX TANK MUD HOUSE	5/72		CT897	8489	CORFAC	
0	10	FA-490 FLOC. HOLD TANK MUD HOUSE	5/72		CT897	8489	CORFAC	
0	10	FA-491 1ST STAGE NEUT. TANK WASTE WATER			CT897			
0	10	FA-492 T1CL4 SCRUBBER SEAL TANK	4/73	NJ2	05005	8691		
0	10	FA-500 FLOC HOLD TANK-MUD HOUSE	4/71		CT905		BETZ	
		SEE W.O. 7176						
0	10	FA-503A WASH WATER RECEIVER-FILTER BLDG	2/73		05002	63	KOMLINE SANDERSON	
0	10	FA-503B WASH WATER RECEIVER-FILTER BLDG	2/73		05002	63	KOMLINE SANDERSON	
0	10	FA-526 SUCTION HEAD TANK FOR GA526 -SEE 7202	7/73		05015			
0	10	FD-406 CAUSTIC STORAGE TANK OLD STAUFFER T-68	8/63	STAUFFER	233	2027	BUFFALO TANK	
0	10	FD-407 PREFILTER FOR GB-4 BLOWBACK COMPRESSR	10/67		CT519	27128	SLAWSON EQUIPMENT	
0	10	FG-464A T1CL4 WASTE DISPOSAL FILTERS	10/67		CT519	24172	KOMLINE SANDERSON	
0	10	FG-464B T1CL4 WASTE DISPOSAL FILTERS	10/67		CT519	24172	KOMLINE SANDERSON	
0	10	FG-464C T1CL4 WASTE DISPOSAL FILTERS	2/73		05002	63	KOMLINE SANDERSON	
0	10	FG-464D T1CL4 WASTE DISPOSAL FILTERS	2/73	NJ2	05002	63	KOMLINE SANDERSON	
0	10	FG-464E ASHCO WATER FILTER TO FG464	8/73		05002	2582	R.P. ADAMS	
0	10	GA-213A LIME CIRCULATION PUMP	9/70		CT800		SANDPIPER	
0	10	GA-213B LIME CIRCULATION PUMP	9/70		CT800		SANDPIPER	
0	10	GA-213S LIME CIRCULATION PUMP	11/71		CT898		SANDPIPER	
0	10	GA-442A FILTRATE PUMP	10/67	MCKEE	CT519	3383	GALIGHER PUMP CO.	
0	10	GA-442S FILTRATE PUMP	10/67	MCKEE	CT519	3383	GALIGHER PUMP CO.	
0	10	GA-442C FILTRATE PUMP	8/73		05002	8611	GALIGHER PUMP CO.	
0	10	GA-442D FILTRATE PUMP	8/73	NJ2	05002	8611	GALIGHER PUMP CO.	
0	10	GA-464A VACUUM PUMP FOR FG-464A	10/67		CT519	24172	KOMLINE SANDERSON	
0	10	GA-464B VACUUM PUMP FOR FG-464B	10/67		CT519	24172	KOMLINE SANDERSON	
0	10	GA-468 WASTE DISPOSAL SUMP PUMP	10/67		CT519			
0	10	GA-479 FILTER CHARGE PUMP REPL. GA-14	10/67		CT519		GALIGHER	
0	10	GA-502 FLOCCULANT PUMP - MUD HOUSE	11/69		CT750	9690	WORTHINGTON	
0	10	GA-509 PUMPS 2T1CL4 EAST SUMP	5/72		CT897	7608	THE DURIRON CO.	
0	10	GA-510 PUMPS 2T1CL4 NORTH SUMP	5/72		CT897	7608	THE DURIRON CO.	
0	10	GA-511 PUMP 2EXIST. CLARIFIER BG-118	5/72		CT897	7 01	COULD	

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IT AREA	EQUIP NBR	DESCRIPTION	DATE TO PP&E	CONTRACTOR NBR	PROJ NBR	PO NBR	EQUIPMENT SUPPLIER	NOTES
0	10	GA-512A PUMPS 2 THICKENER BG-119	5/72	CT897	7606		INDUSTRIAL PUMP EQUIP.	
0	10	GA-512B PUMPS 2 THICKENER BG-119	5/72	CT897	7606		INDUSTRIAL PUMP EQUIP.	
0	10	GA-513 PUMPS FOR FLOC. TO BG-118 & BG-119	5/72	CT897				
0	10	GA-520A CAUSTIC PUMP FOR F8466	8/69	7090	4748		TELCO DURCO	
0	10	GA-520B CAUSTIC PUMP FOR F8466	8/69	7090	4748		TELCO DURCO	
0	10	GA-521 FILTER BLDG. SUMP PUMP	5/72	CT897				
0	10	GA-524A VACUUM PUMP FOR FG-464 C	11/72	05002	63		KOMLINE SANDERSON	
0	10	GA-524B VACUUM PUMP FOR FG-464 D	11/72	05002	63		KOMLINE SANDERSON	
0	10	GA-525A FILTER FG-464 A-D WASH WATER PUMPS	12/72	05002	781		GALIGHER PUMP CO.	
0	10	GA-525B FILTER FG-464 A-D WASH WATER PUMPS	12/72	05002	781		GALIGHER PUMP CO.	
0	10	GA-526A FILTER FEED PUMP			70		ALLEN PUMP	RETI
0	10	GA-526B FILTER FEED PUMP			70		ALLEN PUMP	RETI
0	10	GA-529A DISCHG PUMP FOR FA473 REPLACES GA482	6/73	05017	5126		LAWRENCE PUMP	
0	10	GA-529B DISCHG PUMP FOR FA473 REPLACES GA482	6/73	05017	5126		LAWRENCE PUMP	
0	10	GB-4 BLOWBACK COMPRESSOR FOR FG464A&B	10/67	LUMMUS	4978	506	SUTORBILT	
		SEE CT 519						
0	10	GB-444 MOTOR CONTROL CENTER VENT FAN	1/70	CT678	7411		AMERICAN STANDARD	
0	10	GB-446 PROCESS GAS BLOWER WAS GB-204	8/63	CT740	2756		BUFFALO FORGE	
0	10	GD-450 SCRUBBER BLOWER *TICL4*	4/73	05005	676		BUFFALO FORGE	
0	10	GD-459 LIME POND AGITATOR	8/63	STAUFFER	233	2085	CLEVELAND MIXER CO.	
0	10	GD-448 CROSS CONVEYOR DISPOSAL SYSTEM <i>See BG 118</i>	10/67	CT519	24171		REX CHAINBELT	
0	10	GD-449A FLOCCULATOR DRIVE WASTE DISP. <i>See BG 118</i>	10/67	CT519	24171		REX CHAINBELT	
0	10	GD-449B FLOCCULATOR DRIVE WASTE DISP. <i>See BG 118</i>	10/67	CT519	24171		REX CHAINBELT	
0	10	GD-450 SLUDGE COLLECTR DRV WASTE DISPOSAL DRAG	10/67	CT519	24171		REX CHAINBELT	
		DRAG CONVEYOR & CROSS CONVEYOR <i>(See BG 118)</i>						
0	10	GD-463 AGITATOR FOR FA-473	1/70	CT678	5820		PHILADELPHIA GEAR	
0	10	GD-471 AGITATOR FOR FA-481	11/69	CT750	9690		BETZ LAB., INC.	
0	10	GD-476 AGITATOR FOR FLOC TANK FA-490	5/72	CT897	8502		MIXING EQUIPMENT CO.	
0	10	GD-479 AGITATOR FOR FLOC TANK FA-489		CT897				
0	10	GD-480 AGITATOR FOR 2ND STAGE NEUT. TK FA488	8/72	CT897				
0	10	GD-481 AGITATOR FOR 1ST STAGE NEUT. TK FA491	8/72	CT897	9825		MIXER EQUIP. CO. INC.	
0	10	GD-489 AGITATOR FOR HOLD TANK-FA500	11/71	CT905				
0	10	JD-446 SLUDGE CONVEYOR FOR FG464A/B	8/73	05002	1054		POWER PACK CONVEYOR	
0	10	JD-447 SLUDGE CONVEYOR FOR FG464C/D	8/73	05002			POWER PACK CONVEYOR	
0	10	PA-443 OHMART DENSITY UNIT						
0	10	PA-453A SLUICE POTS BENEATH SPRAY DRYR ROTARY L	10/64					
0	10	PA-453B SLUICE POTS BENEATH SPRAY DRYR ROTARY L	11/64					
0	10	PA-453C SLUICE POTS BENEATH SPRAY DRYR ROTARY L	11/64					
0	10	PA-453D SLUICE POTS BENEATH SPRAY DRYR ROTARY L	9/67					
0	10	PA-453E SLUICE POTS BENEATH SPRAY DRYR ROTARY L	9/67					
0	10	PA-455 VENTURI EDUCTOR S-D	4/70					
0	10	PA-469 TICL4 UNIT SCRUBBER VENTURI	4/73	05005	6760		POLY-CON CORP.	

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UNIT	AREA	EQUIP NBR	DESCRIPTION	DATE TO	CONTRACTOR	PROJ NDR	PO NBR	EQUIPMENT SUPPLIER	NOTES
*****COMPRESSED AIR									
20	19	EA-102X	PLANT & VIBRATOR AIR COMP. INTER-COOLER <i>see GB101S</i>	12/64	LUMMUS	4978	510	WORTHINGTON CORP.	
20	19	EA-102S	PLANT & VIBRATOR AIR COMP. INTER-COOLER <i>see GB101S</i>	12/64	LUMMUS	4978	510	WORTHINGTON CORP.	
20	19	EA-103X	PLANT & VIBRATOR AIR COMP. AFTER-COOLER <i>see GB101S</i>	12/64	LUMMUS	4978	510	WORTHINGTON CORP.	
20	19	EA-103S	PLANT & VIBRATOR AIR COMP. AFTER-COOLER <i>see GB101S</i>	12/64	LUMMUS	4978	510	WORTHINGTON CORP.	
20	19	EA-104X	PADDING AIR INTERCOOLER <i>see GB101S</i>	12/64	LUMMUS	4978	510	WORTHINGTON CORP.	
20	19	EA-105X	PADDING AIR AFTERCOOLER <i>see GB101S</i>	12/64	LUMMUS	4978	510	WORTHINGTON CORP.	
20	19	EA-108X	INSTRUMENT AIR AFTERCOOLER <i>see GB101S</i>	12/64	LUMMUS	4978		WORTHINGTON CORP.	
20	19	EA-400	INTERCOOLER <i>see GB101S</i>	12/64		CT094	3252	WORTHINGTON	
20	19	EA-400S	INTERCOOLER <i>see GB101S</i>	12/64		CT386	19347	WORTHINGTON	
20	19	EA-405X	AFTERCOOLER <i>see GB101S</i>	12/64		CT094	3252	WORTHINGTON	
20	19	FA-107X	PLANT & VIBRATOR AIR RECEIVER <i>see GB101S</i>	12/64	LUMMUS	4978	510	WORTHINGTON CORP.	
20	19	FA-108X	PADDING AIR RECEIVER <i>see GB101S</i>	12/64	LUMMUS	4978	510	WORTHINGTON CORP.	
20	19	FA-112X	INSTRUMENT AIR RECEIVER <i>see GB101S</i>	12/64	LUMMUS	4978	510	WORTHINGTON CORP.	
20	19	FA-405X	AIR RECEIVER <i>see GB101S</i>	12/64		CT094	3252	WORTHINGTON CORP.	
20	19	FA-405S	AIR RECEIVER <i>see GB101S</i>	12/66		CT386	19347	WORTHINGTON CORP.	
20	19	FD-102X	PREFILTER-INST. AIR SYSTEM WITH <i>see GB101S</i>	12/64	LUMMUS	4978	1001	TRINITY	
20	19	FD-103X	AFTERFILTER-INST. AIR SYSTEM <i>see GB101S</i>	12/64	LUMMUS	4978	1001	TRINITY	
20	19	FD-104X	PREFILTER-PADDING AIR SYSTEM <i>see GB101S</i>	12/64	LUMMUS	4978	1001	TRINITY	
20	19	FD-105X	AFTERFILTER-PADDING AIR SYSTEM <i>see GB101S</i>	12/64	LUMMUS	4978	1001	TRINITY	
20	19	FD-401S	PREFILTER FOR PLANT AIR DRYER <i>see GB101S</i>	12/64		CT059	2334	LESTER JOHNSON	
20	19	FG-102X	AIR INTAKE FILTER WITH <i>see GB101S</i>	12/64	LUMMUS	4978	510	WORTHINGTON	
20	19	FG-103X	AIR INTAKE FILTER WITH <i>see GB101S</i>	12/64	LUMMUS	4978	510	WORTHINGTON	
20	19	FG-104X	AIR INTAKE FILTER WITH <i>see GB101S</i>	12/64	LUMMUS	4978	510	WORTHINGTON	
20	19	FG-405X	INTAKE FILTER FOR <i>see GB101S</i>	12/64		CT094	3252	WORTHINGTON	
20	19	FG-405S	AIR INTAKE FILTER WITH <i>see GB101S</i>	12/66		CT386	19347	WORTHINGTON	
20	19	FG-407	FILTER ON <i>see GB101S</i>	2/70		CT757	3253	DELTECH	
20	19	FG-408	FILTER ON <i>see GB101S</i>	2/70		CT757	3253	DELTECH	
20	19	GB-101	PLANT & VIBRATOR AIR COMPRESSOR	12/64	LUMMUS	4978	510	WORTHINGTON	
20	19	GB-101S	PLANT COMPRESSOR	12/66		CT419	20996	WORTHINGTON	
20	19	GB-102	PADDING AIR COMPRESSOR	12/64	LUMMUS	4978	510	WORTHINGTON	
20	19	GB-103	INST. AIR COMPRESSOR	12/64	LUMMUS	4978	510	WORTHINGTON	
20	19	GB-405	BLOWBACK AIR COMPRESSOR	12/64		CT094	3252	WORTHINGTON	
20	19	GB-405S	BLOWBACK AIR COMPRESSOR	12/66		CT386	19347	WORTHINGTON	
20	19	KA-101	INSTRUMENT AIR DRYER FOR GB-108	12/64	LUMMUS	4978	1001	TRINITY	
20	19	KA-102	PADDING AIR DRYER FOR GB-102	12/64	LUMMUS	4978	1001	TRINITY	
20	19	KA-401	PLANT AIR DRYER - GB101	12/64		CT059	2334	LESTER JOHNSON	
20	19	KA-401S	PLANT AIR DRYER - GB101S	12/66		CT419	21703	LESTER JOHNSON	
20	19	KA-405	NEW PLANT AIR COMPRESSOR DRYER - GB405	12/64		CT094	3222	TRINITY	
20	19	KA-405S	NEW PLANT AIR COMPRESSOR DRYER - GB405S	12/66		CT386		TRINITY	

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UNIT	AREA	EQUIP NBR	DESCRIPTION	DATE TO PP&E	CONTRACTOR	PROJ NBR	PO NBR	EQUIPMENT SUPPLIER	NOTES
*****STEAM									
20	20	BA-407	OIL PREHEATER FOR BF-102	3/71		CT846		CHROMALOX	
20	20	BF-101	STEAM GENERATOR-COAL	12/64	LUMMUS	4978	2506	BABCOCK AND WILCOX	
20	20	BF-102	STEAM GENERATOR-GAS	1/70		CT687	9295	INDECK POWER EQUIP. CO.	
20	20	BH-2	STEAM SEPARATOR-AFTER DESUPERHEATER	12/64	LUMMUS	4978			
20	20	EA-101	BOILER FEED WATER ONE HEATER TOWER	12/64	LUMMUS	4978	407	WHITLOCK	
20	20	EG-101	DEAERATOR	12/64	LUMMUS	4978	409	HOPPES MFG. CO.	
20	20	FA-102	BLOWDOWN TANK	12/64	LUMMUS	4978	336	ALPHA TANK	
20	20	FA-402	OCTAFILM T-3 FEEDER TO STEAM HEADER	12/64		CT039	2194	A. LOUIS STEEL	
20	20	FE-2	RAIL CAR HOPPER	12/64	LUMMUS	4978	2514	BARTLETT-SNOW-PACIFIC	
20	20	FE-101	COAL STORAGE SILO	12/64	LUMMUS	4978	2503	NEFF & FRY	
20	20	FE-102X	ASH STORAGE SILO WITH JD-103	12/64	LUMMUS	4978	2508	NATIONAL CONVEYORS	
20	20	GA-106A	BOILER FEED PUMP & SPARE	12/64	LUMMUS	4978	525	WORTHINGTON	
20	20	GA-106B	BOILER FEED PUMP & SPARE	12/64	LUMMUS	4978	525	WORTHINGTON	
20	20	GA-402	PROPORTIONING PUMP FOR OCTAFILM	12/64		CT039	2019	CHEMICAL PUMP & EQUIPMEN	
20	20	GA-497	FUEL OIL PUMP FOR BF-102	3/71		CT846			
20	20	GA-514	METERING PUMP FOR BF-101 FUEL SOLVE 60	8/71		CT685			
SEE W.O. 7095									
20	20	<del>GA-103X</del>	F.O. FAN WITH BF-101	12/64	LUMMUS	4978	2506	BABCOCK & WILCOX	
20	20	<del>GA-104X</del>	I.O. FAN WITH BF-101	12/64	LUMMUS	4978	2506	BABCOCK & WILCOX	
20	20	<del>GH-102A</del>	SOOT BLOWERS WITH BF-101	12/64	LUMMUS	4978	2506	BABCOCK & WILCOX	
20	20	<del>GH-103B</del>	SOOT BLOWERS WITH BF-101	12/64	LUMMUS	4978	2506	BABCOCK & WILCOX	
20	20	<del>GH-105C</del>	SOOT BLOWERS WITH BF-101	12/64	LUMMUS	4978	2506	BABCOCK & WILCOX	
20	20	<del>GH-105D</del>	SOOT BLOWERS WITH BF-101	12/64	LUMMUS	4978	2506	BABCOCK & WILCOX	
20	20	<del>GH-109X</del>	OVENFIRE AIR FAN WITH BF-101	12/64	LUMMUS	4978	2506	BABCOCK & WILCOX	
20	20	<del>GH-110X</del>	DUST COLLECTOR FAN WITH BF-101	12/64	LUMMUS	4978	2506	BABCOCK & WILCOX	
20	20	<del>GH-111X</del>	AUXILIARY GAS BURNER IN PLACE	12/64	LUMMUS	4978			
20	20	<del>GH-450</del>	COMBUSTION AIR BLOWER BF-102	1/70		CT687	9295	INDECK POWER EQUIP.	
20	20	JD-1	BELT CONVEYOR COAL & COKE	12/64	LUMMUS	4978	2514	BARTLETT-SNOW	
20	20	JD-2	BUCKET ELEVATOR COAL & COKE	12/64	LUMMUS	4978	2514	BARTLETT-SNOW	
20	20	JD-101X	SPREADER STOKER	12/64	LUMMUS	4978			
20	20	JD-102X	ASH HANDLING SYSTEM	12/64	LUMMUS	4978	2508	NATIONAL CONVEYOR	
20	20	JD-103	ASH HANDLING SYSTEM	12/64	LUMMUS	4978	2508	NATIONAL CONVEYOR	
20	20	PA-1	CAR SPOTTER	12/64	LUMMUS	4978	1613	HEUSTER	
20	20	PA-22	CAR SHAKER COAL	12/64	LUMMUS	4978	1614	HEWITT-ROBBINS	
20	20	PA-33X	TWO-WAY FLOP GATE W/ JD-2	12/64	LUMMUS	4978	2514	BARTLETT-SNOW	
20	20	PA-102X	COAL LIVE STORAGE GATE WITH FG-101	12/64	LUMMUS	4978	2503	NEFF & FRY	
20	20	PA-103X	COAL DEAD STORAGE SLIDE GATE WITH FF101	1/26	LUMMUS	4978	42503	NEFF & FRY	
20	20	PA-104	NON-SEGREGATING COAL CHUTE	12/64	LUMMUS	4978	1627	STOCK	
20	20	PA-445	PORTABLE HOPPER CAR TRAINING TUBE EQUIP	10/67		CT580	29544	MAUCK MFG. CO.	

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UNIT	AREA	EQUIP NBR	DESCRIPTION	DATE TO PP&E	CONTRACTOR	PROJ NBR	PO NBR	EQUIPMENT SUPPLIER	NOTES
***** WATER TREATING									
20	21	BG-101	ALKALINITY CONTROL SYSTM COOLNG TOWER	12/64	LUMMUS	4978		G.P. SCHUMACKER	REMOVED
20	21	BG-102	SULPHATE INJECTION SYSTEM B.F.W.	12/64	LUMMUS	4978	109	MILTON ROY	
20	21	BG-103	PHUSPHATE INJECTION SYSTEM FOR BF-101	12/64	LUMMUS	4978	109	MILTON ROY	
20	21	BG-106	PHUSPHATE INJECTION FOR BF-102	12/64	LUMMUS	4978	109	MILTON ROY	
20	21	BG-108	COLD PROCESS SOFTENER & COAGULATOR	12/64	LUMMUS	4978	107	PERMUTIT	
20	21	BG-109	WATER FILTERING PLANT	12/64	LUMMUS	4978	107	PERMUTIT	
20	21	BG-110	DEMINERALIZING PLANT	12/64	LUMMUS	4978	107	PERMUTIT	
20	21	BG-111	SODIUM ZEOLITE WATER SOFTENING	12/64	LUMMUS	4978	107	PERMUTIT	
20	21	BG-113X	MIXING CHAMBER FOR SOFT PROCESS H2SO4	12/64	LUMMUS	4978	109	MILTON ROY	REMOVED
	21	BG-114X	MIXING CHAMBER FOR PROCESS DEM. H2SO4	12/64	LUMMUS	4978	109	MILTON ROY	
	21	BG-116	CHROMATIC FEEDER TO COOLING TOWER	5/67		CT308		G. P. SCHUMACKER	REMOVED
20	21	EE-10AX	EJECTORS W/BG-109	12/64	LUMMUS	4978	107	PERMUTIT	
20	21	EE-10BX	EJECTORS W/BG-109	12/64	LUMMUS	4978	107	PERMUTIT	
20	21	FA-101A	SODIUM ZEOLITE TREATING TANK WITH BG-111	12/64	LUMMUS	4978	107	PERMUTIT	
20	21	FA-101B	SODIUM ZEOLITE TREATING TANK WITH BG-111	12/64	LUMMUS	4978	107	PERMUTIT	
20	21	FA-101C	SODIUM ZEOLITE TREATING TANK WITH BG-111	1/70		CT687		PERMUTIT	
20	21	FA-101A	DEMINERALIZER CATION EXCHANGERS W/BG-110	12/64	LUMMUS	4978	107	PERMUTIT	
20	21	FA-104X	ALUM SOLUTION TANK WITH BG-108	12/64	LUMMUS	4978	107	PERMUTIT	
20	21	FA-105X	LIME SOLUTION TANK WITH BG-108	12/64	LUMMUS	4978	107	PERMUTIT	
20	21	FA-110X	H2SO4 TANK WITH BG-101	12/64	LUMMUS	4978	109	MILTON ROY	REMOVED
20	21	FA-111A	DEMINERALIZER ANION EXCHANGERS W/BG-111	12/64	LUMMUS	4978	107	PERMUTIT	
20	21	FA-111B	DEMINERALIZER ANION EXCHANGERS W/BG-111	12/64	LUMMUS	4978	107	PERMUTIT	
20	21	FA-113X	SULPHATE TANK WITH BG-102	12/64	LUMMUS	4978	109	MILTON ROY	
20	21	FA-114X	PHOSPHATE TANK WITH BG-103	12/64	LUMMUS	4978	109	MILTON ROY	
20	21	FA-116	SOFT WATER STORAGE TANK	7/66		CT382		LAKE SHORE STEEL	REMOVED
20	21	FB-101	CLEARWELL	12/64	LUMMUS	4978	2522	WORTHINGTON	
20	21	FB-107X	CARBONATE TANK WITH BG-110	12/64	LUMMUS	4978	107	PERMUTIT	
20	21	FB-108X	ACID TANK WITH BG-110	12/64	LUMMUS	4978	107	PERMUTIT	
20	21	FB-109X	ALUM DILUTION TANK WITH BG-108	12/64	LUMMUS	4978	107	PERMUTIT	
20	21	FB-110X	LIME DILUTION TANK WITH BG-108	12/64	LUMMUS	4978	107	PERMUTIT	
20	21	FB-111A	LOOP SEAL TANK WITH BG-109	12/64	LUMMUS	4978	107	PERMUTIT	
20	21	FB-111B	LOOP SEAL TANK WITH BG-109	12/64	LUMMUS	4978	107	PERMUTIT	
20	21	FB-304	H2SO4 STORAGE TANK	5/67		CT308	20787	YOUNGSTOWN STEEL TANK	
20	21	FD-101A	AUTOMATIC GRAVITY WATR FILTR W/BG-109	12/64	LUMMUS	4978	107	PERMUTIT	
20	21	GA-101A	PHOSPHATE INJECTION PUMP WITH BG-103	12/64	LUMMUS	4978	109	MILTON ROY	
20	21	GA-101B	PHOSPHATE INJECTION PUMP WITH BG-103	12/64	LUMMUS	4978	109	MILTON ROY	
20	21	GA-101C	PHOSPHATE INJECTION PUMP WITH BG-103	1/70		CT687	9256	CHEMPUMP	
20	21	GA-104A	CLARIFIED H2O FEED PUMP & SPARE	12/64	LUMMUS	4978	514	GOULD PUMP	
20	21	GA-104B	CLARIFIED H2O FEED PUMP & SPARE	12/64	LUMMUS	4978	514	GOULD PUMP	
20	21	GA-111A	BRINE PUMP & SPARE	12/64	LUMMUS	4978	514	GOULD PUMP	
20	21	GA-111B	URINE PUMP & SPARE	12/64	LUMMUS	4978	514	GOULD PUMP	
20	21	GA-112X	SULPHATE PUMP WITH BG-102	12/64	LUMMUS	4978	109	MILTON ROY	
20	21	GA-113A	H2SO4 PUMP & SPARE WITH BG-101	12/64	LUMMUS	4978	109	MILTON ROY	REMOVED
20	21	GA-113B	H2SO4 PUMP & SPARE WITH BG-101	12/64	LUMMUS	4978	109	MILTON ROY	REMOVED
20	21	GA-114A	H2SO4 PUMP & SPARE WITH BG-105	12/64	LUMMUS	4978	109	MILTON ROY	REMOVED
20	21	GA-114X	H2SO4 PUMP & SPARE WITH BG-105	12/64	LUMMUS	4978	109	MILTON ROY	REMOVED
20	21	GA-114B	H2SO4 PUMP & SPARE WITH BG-105	12/64	LUMMUS	4978	109	MILTON ROY	REMOVED
20	21	GA-116X	SCALE CONTROL PUMP WITH BG-106	12/64	LUMMUS	4978	109	MILTON ROY	
20	21	GA-119X	WATER PUMP ON SOFT WATER SURGE TANK	12/64	LUMMUS	4978	108	FISHER & PORTER CO.	REMOVED

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20	21	<del>GA-121A</del>	LIME PUMP WITH <del>RG-108</del>	12/64	LUMHUS	4978		PERMUTIT	
20	21	GA-121B	LIME PUMP WITH <del>RG-108</del>	12/64	LUMHUS	4978	107	PERMUTIT	
20	21	<del>GA-121C</del>	SPARE FOR GA-121AX & BX	12/64	LUMHUS	4978	107	PERMUTIT	
20	21	GA-515	METERING PUMP H2SO4 TO COOLING TOWER	8/68		CT308			
20	21	GA-516	METERING PUMP DE-460 TO COOLING TOWER	8/68		CT308			
20	21	GA-517	METERING PUMP POLYNOR TO COOLING TOWER	8/69		CT308			
20	21	GD-101X	MIXER ALUM. TANK	12/64				LIGHTNIN	
20	21	GD-102X	MIXER LIME TANK	12/64				LIGHTNIN	
20	21	<del>GD-103</del>	PRECIPITATOR AGITATOR W/ <del>RG-108</del>	12/64	LUMHUS	4978		PERMUTIT	
20	21	KA-430	VENT DRYER FOR FB-304	5/67		CT308			

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*****CO GENERATION									
20	22	BA-401	T.E.G. REBOILER	5/67	MACMULLIN	CT418	1368	BLACK SIVALLS & BRYSON INC	
20	22	BU-1	COKE DRYER	12/64	LUMMUS	4978	2516	BAKLETT SNOW	
20	22	CB-1X	FLAKE STACK WITH DC-1	12/64	LUMMUS	4978	100	WELLMAN ENGINEERING	
20	22	CU-3X	FLAKE STACK BURNER WITH PA-31	12/64	LUMMUS	4978	1619	JOHN ZINK	
20	22	DA-427	H2O SPRAY TOWER CO SYSTEM	5/67	MACMULLIN	CT418	1400	WILLIAM STANLEY COMPANY	
20	22	DA-428A	NATIONAL DUST FILTERS CO SYSTEM	5/67	MACMULLIN	CT418	1365	NATIONAL DUST COLLECTORS	
20	22	DA-428B	NATIONAL DUST FILTERS CO SYSTEM	5/67	MACMULLIN	CT418	1365	NATIONAL DUST COLLECTORS	
20	22	DA-429A	AMER. AIR FILTER CYCOIL CO SYSTEM	5/67	MACMULLIN	CT418	1364	AMERICAN AIR FILTER	
20	22	DA-429B	AMER. AIR FILTER CYCOIL CO SYSTEM	5/67	MACMULLIN	CT418	1364	AMERICAN AIR FILTER	
	22	DA-431	ABSORBER COLUMN CO SYSTEM	5/67	MACMULLIN	CT418	1368	BLACK SIVALLS, BRYSON IN	
	22	DA-432	STRIPPER COLUMN CO SYSTEM	5/67	MACMULLIN	CT418	1368	BLACK SIVALL, BRYSON INC	
20	22	DA-434	H2O SPRAY TOWER CO2 SYSTEM	6/68		CT648			
20	22	DC-1	CO GENERATOR	12/64	LUMMUS	4978	100	WELLMAN ENGINEERING	
20	22	DC-402	CO2 PRODUCER	9/70		CT683			
			SEE CT 368						
20	22	EA-426	GLYCOL COOLER CO SYSTEM	5/67	MACMULLIN	CT418	1381	STRUTHERS WELLS	
20	22	EA-428	GLYCOL ABSORBER FEED COOLER	5/67	MACMULLIN	CT418	1368	BROWN FINTUBE	
20	22	EA-446	CO2 VAPORIZER	12/64		CT026		LIQUID CARBONIC	
20	22	EA-454	CO2 COOLER	3/69		CT637	2865	TOWERS, MYERS & CO.	
20	22	EA-455	FUEL OIL TANK HEATER	9/70		CT683	8636	BROWN FINTUBE CO.	
20	22	EA-457	FUEL OIL PREHEATER	9/70		CT683	9034	E.L. WEIGAND CHROMOLOX	
20	22	EA-458	CO2 BURNER H2O COOLER	9/70		CT683	9321	DOYLE & ROTH	
20	22	EA-462	HEATER FOR CO2 TO DC-1			8005		TOWERS & MYERS	
20	22	EA-432	T.E.G. SURGE TANK CO SYSTEM	5/67	MACMULLIN	CT418	1368	BLACK, SIVALLS, & BRYSON	
20	22	FA-438	CO SEAL TANK	5/67	MACMULLIN	CT418		HASBROOK PLASTICS INC.	
20	22	FA-471	TEG CLEAN-OUT POT			7059		CABOT	
20	22	FA-478	COOLING H2O-CO2 GENERATOR			CT683			
20	22	FB-469	FUEL OIL STORAGE	9/70		CT683	8646	BUFFALO TANK	
20	22	FD-404	H2O FILTER CO SYSTEM	5/67	MACMULLIN	CT418	1363	PERMUTIT	
	22	FD-405	GLYCOL FILTER	5/67	MACMULLIN	CT418		BLACK, SIVALL, & BRYSON	
	22	FD-406	WATER FILTER	5/67	MACMULLIN	CT418	1394	ZURN INDUSTRIES	
20	22	FD-411	TEG SEPARATOR	6/68		CT673	3026	ANDERSON	
			SEE W05015						
20	22	FD-412	REGENERATIVE DUST COLLECTOR	1/68		CT597	29839	BRESLOVE SEPARATOR CO.	
20	22	FD-443	DUPLEX OIL BASKET STRAINER	4/72				HAYWARD MFG. CO.	
20	22	FD-444	DUPLEX OIL BASKET STRAINER	9/70				KRAISSL CO. INC.	
20	22	FE-1	COKE STORAGE SILO	12/64	LUMMUS	4978	2503	NEFF & FRY	
20	22	FG-9	HAG FILTER COKE AREA	12/64	LUMMUS	4978	319	PULVERIZING MACHINE CO.	
20	22	GA-436A	DESORBER FEED PUMP-CO SYSTEM	5/67	MACMULLIN	CT418	1368	BLACK SIVALL BRYSON	
20	22	GA-436S	DESORBER FEED PUMP SPARE	5/67	MACMULLIN	CT418	1380	BLACK SIVALLS BRYSON	
20	22	GA-437	ABSORBER FEED PUMP-CO SYSTEM	5/67	MACMULLIN	CT418	1368	BLACK SIVALLS BRYSON	
20	22	GA-438	SUMP PUMP CO SYSTEM	5/67	MACMULLIN	CT418	1404	BUFFALO FORGE	
20	22	GA-439	BACKWASH PUMP CO SYSTEM	5/67	MACMULLIN	CT418	1404	BUFFALO FORGE	
20	22	GA-481	ASHCO WATR BOOSTER PUMP TO CYCOIL FILTR	1/68		CT600		TELCO DURCO	
20	22	GA-488	FUEL OIL PUMP	9/70		CT683	8658	DE-LAVAL TURBINE, INC.	
20	22	GA-489	CO2 BURNER COOLING H2O PUMP	9/70		CT683	9502	GOULD PUMP	
20	22	GB-5	CO GAS BLOWER	12/64	LUMMUS	4978	506	SUTORBILT	
20	22	GB-5S	SPARE CO GAS BLOWER	12/64		CT082	3032	SUTORBILT	

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20	22	<del>GH-6X</del>	STARTUP BLOWER FOR DC-1 <i>see</i>	12/64	LUMMUS	4978	100	WELLMAN	
20	22	<del>GH-17</del>	EXHAUST BLOWER FOR FG-9 <i>see DC-1</i>	12/64	LUMMUS	4978	515	BUFFALO FORGE	
20	22	<del>GH-18X</del>	COMBUSTION AIR BLOWER FOR HR-1 <i>see DC-1</i>	12/64	LUMMUS	4979	2516	BARTLETT SNOW	
20	22	<del>GH-400</del>	CO SEAL TANK EXHAUST BLOWER <i>see DC-1</i>	5/67	MACMULLIN	CT418		ROBBINS & MEYERS	
20	22	GH-430	CO COMPRESSOR	5/67	MACMULLIN	CT418	1376	NASH ENGINEERING CO.	
20	22	GC-402	CO2 REFRIG. PACKAGE	3/69		CT637	2874	J. DONNELLY REFR. CO. CO	
20	22	<del>JD-3X</del>	VIBRATING FEEDER COKE <i>see JD-4</i>	12/64	LUMMUS	4978	2516	BARTLETT-SNOW	
20	22	JD-4	ELEVATOR COKE	12/64	LUMMUS	4978	2514	BARTLETT-SNOW	
20	22	<del>PA-31</del>	CO FLARE ASSEMBLY <i>see DC-1</i>	12/64	LUMMUS	4978	1619	JOHN ZINK	
20	22	<del>PA-32</del>	CO FLAME ARRESTOR <i>see DC-1</i>	12/64	LUMMUS	4978	1620	SHAND & JURS	
20	22	<del>PA-34</del>	COKE LIVE STORAGE SLIDE GATE <i>see FE-1</i>	12/64	LUMMUS	4978	2503	NEFF & FRY	
0	22	<del>PA-40</del>	COKE DEAD STORAGE SLIDE <i>see FE-1</i>	12/64	LUMMUS	4978	2503	NEFF & FRY	
0	22	PA-403	FLAME ARRESTOR ON CO2 GENERATOR FLARE	12/64		CT026			
20	22	PA-461	ANDERSON SEPARATOR	11/71		CT894		OHIO PIPE	

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*****OXIDATION COLLECTION- CALCINING									
20	23	BA-405	STEAM HEATR-DRAW THRU CLIMATE CHANGER	2/70		CT739	2485	TRANE-AIR HANDLNG UNITS	
20	23	CB-402A	DC-2A VENT STACK	12/64	LUMMUS	4978			
20	23	CB-402B	DC-2B VENT STACK	12/64	LUMMUS	4978			
20	23	DC-2A	OXIDATION FURNACE	12/64	LUMMUS	4970	348	COLONIAL & WARWICK	
20	23	DC-2B	OXIDATION FURNACE	12/64	LUMMUS	4978	348	COLONIAL & WARWICK	
20	23	EA-5	TICL4 VAPORIZER	12/64	LUMMUS	4978	400	STRUTHERS WELLS	
20	23	EA-5S	TICL4 VAPORIZER	3/68		CT579	31316	VULCAN MFG. CO.	
20	23	EA-7CS	PRIMARY PROD GAS COOLER ALUM	12/64	LUMMUS	4978	411	IND PROCESS ENG	
20	23	EA-7	PRIMARY PROD. GAS COOLER INCONEL	4/70		CT742		INDUSTRIAL PROCESS ENG.	
			SPARE FOR EA-7AS & BS						
	23	EA-7A1	PRODUCT GAS COOLERS INCONEL	10/66		CT405	19982	INDUSTRIAL PROCESS ENG.	
20	23	EA-7A2	PRODUCT GAS COOLERS INCONEL	10/66		CT405	19982	INDUSTRIAL PROCESS ENG.	
20	23	EA-7B1	PRODUCT GAS COOLERS INCONEL	10/66		CT405	19982	INDUSTRIAL PROCESS ENG.	
20	23	EA-7B2	PRODUCT GAS COOLERS INCONEL	10/66		CT405	19982	INDUSTRIAL PROCESS ENG.	
20	23	EA-7C1	PRODUCT GAS COOLERS ALUM.	7/65		CT159	8321	INDUSTRIAL PROCESS ENG.	
20	23	EA-7C2	PRODUCT GAS COOLERS ALUM.	7/65		CT159	8321	INDUSTRIAL PROCESS ENG.	
20	23	EA-26D	AL2CL6 SUBLIMER	5/70		CT708	1793	E & W SERVICES	
20	23	EA-26C	AL2CL6 SUBLIMER	3/67		CT389	19314	BUARDMAN CO.	
20	23	EA-27	BURNER CIRC.-WATER COOLER	12/64	LUMMUS	4978	400	STRUTHERS WELLS	
20	23	EA-33X	CARRIER N2 PREHEATER	12/64	LUMMUS	4978	503	FRICK	
20	23	EA-43	GAS HEATER	12/64	LUMMUS	4978			RETIRED
20	23	EA-43S	CN GAS HEATER	2/69		CT655	2980	DOYLE & ROTH MFG.	
20	23	EA-429	N2 HEATER TO SUBLIMER	5/66		7036	13496	AMERICAN STANDARD	
20	23	FA-26A	CATCH POT UNDER DC2A	12/64	LUMMUS	4978	353	ALPHA	
20	23	FA-26B	CATCH POT UNDER DC2B	12/64	LUMMUS	4978	353	ALPHA	
20	23	FA-36	BURNER CIRC. WATER SURGE TANK	12/64	LUMMUS	4978	326	QUAKER CITY	
20	23	FA-210	EA-5 BLOWDOWN TANK MOBILE UNIT	10/64	LUMMUS	5094	300	BUFFALO TANK DIV./BETHLE	
20	23	FA-406	AIR SURGE TANK W/GB-405	12/64		CT094	3623	ADAMSON TANK CO.	
20	23	FA-435	K-ADDITION TANKS	4/66		CT384	18168	HEIL PROCESS	
20	23	FA-436	K-ADDITION TANKS	4/66		CT384	18168	HEIL PROCESS	
20	23	FB-5A	TICL4 STORAGE TANKS	12/64	LUMMUS	4978	308	YOUNGSTOWN STEEL TANK	
20	23	FB-5B	TICL4 STORAGE TANKS	12/64	LUMMUS	4978	308	YOUNGSTOWN STEEL TANK	
20	23	FB-5C	TICL4 STORAGE TANKS	12/64	LUMMUS	4978	308	YOUNGSTOWN STEEL TANK	
20	23	FB-5	SICL4 STORAGE TANKS	12/64	LUMMUS	4978	303	BUFFALO TANK DIVISION	
20	23	FB-457	AL2CL6 RESIDUE POT	3/67		CT389	19314	BUARDMAN CO.	REMOVED
20	23	FC-402	CYCLONE AT CALCINER	8/66		CT406	19762	WICKLIFFE SERVICES	
20	23	FD-3	TICL4 SEPARATOR	12/64	LUMMUS	4978	327	TELCO, INC.	REMOVED
20	23	FE-414	FILTER AL2CL6 SYSTEM	5/69		CT611	1997	THE DUCON CO.	
20	23	FE-6	TIO2 OXIDATION SURGE TANK	12/64	LUMMUS	4978	347	LITTLEFORD BROS.	
20	23	FE-400	AL2CL6 STORAGE BIN-100,000	5/69		CT611	2268	E & W SERVICES	
20	23	FE-401A	AL2CL6 DAY BIN 5,000	5/69		CT611	2268	E & W SERVICES	
20	23	FE-401B	AL2CL6 DAY BIN 5,000	5/69		CT611	2268	E & W SERVICES	
20	23	FE-401C	AL2CL6 DAY BIN 5,000	5/69		CT611	2268	E & W SERVICES	
20	23	FG-2	BAG FILTER	12/64	LUMMUS	4978	306	PULVERIZING MACHINE CO.	
20	23	FG-7S	BAG FILTER SPARE	12/64		CT127	8283	PULVERIZING MACHINE CO.	
20	23	FG-404A	MAIN PRODUCT BAG FILTER	7/65		CT159	8076	PULVERIZING MACHINE CO.	
20	23	FG-404B	MAIN PRODUCT BAG FILTER	7/65		CT159	8076	PULVERIZING MACHINE CO.	
20	23	FG-404C	MAIN PRODUCT BAG FILTER	7/65		CT159	8076	PULVERIZING MACHINE CO.	
20	23	FG-404D	MAIN PRODUCT BAG FILTER	7/65		CT159	8076	PULVERIZING MACHINE CO.	

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20	23	FG-404E	MAIN PRODUCT BAG FILTER	12/66	MCKEE	CT404	3383	PULVERIZING MACHINE CO.	
20	23	FG-404F	MAIN PRODUCT BAG FILTER	12/66	MCKEE	CT404	3383	PULVERIZING MACHINE CO.	
20	23	GA-8	SICL4 TRANSFER PUMP	12/64	LUMMUS	4978	504	CHEMPUMP	
20	23	GA-10A	TICL4 VAPORIZER FEED PUMP	12/64	LUMMUS	4978	504	CHEMPUMP	
20	23	GA-10J	TICL4 VAPORIZER FEED PUMP	12/64	LUMMUS	4978	504	CHEMPUMP	
20	23	GA-36A	BURNER COOLING WATER PUMP & SPARE	12/64	LUMMUS	4978	519	GOULD PUMP	
20	23	GA-36B	BURNER COOLING WATER PUMP & SPARE	12/64	LUMMUS	4978	519	GOULD PUMP	
20	23	GA-425A	OIL PUMP FOR GB-412A <i>see</i>	7/65		CT159			
20	23	GA-425B	OIL PUMP FOR GB-412B <i>see</i>	7/65		CT159			
20	23	GA-425C	COMBUSTION AIR BLOWER FOR PA-36 <i>see</i>	12/64	LUMMUS	4978	2526	BARTLETT SNOW	
20	23	GB-412A	RECYCLE BLOWER	7/65		CT159	7718	AMERICAN STANDARD	
0	23	GB-412B	RECYCLE BLOWER	7/65		CT159	7718	AMERICAN STANDARD	
0	23	GB-414A	START-UP STACK BLOWER-DC-2A	12/64		CT125	7972	QUICK DRAFT CORP.	
20	23	GB-414B	START-UP STACK BLOWER-DC-2B	7/65		CT159	11092	QUICK DRAFT CORP.	
20	23	GB-429	CALCINER EXHAUST FAN	8/66	MCKEE	CT406	3383	GENERAL BLOWER CO.	
20	23	GB-442	COMBUSTION AIR BLOWER FOR PA-36 <i>see</i>	9/68		CT654	4209	NORTH AMERICAN	
20	23	GB-448	PERMEABILITY TESTER FAN FILTER BAG	12/69		CT737			REMOVED
20	23	GB-452	BLOWER ON PA-405 HEATER <i>see PA-405</i>	2/70		CT739			
20	23	GB-454	VENT BLOWER MCC104						
20	23	GB-470	INTAKE FILTER GB30 <i>see PA-36</i>	12/74	LUMMUS	4978		LUMMUS	
20	23	GB-471	INTAKE FILTER GB442 <i>see PA-36</i>	9/68		CT654		AIK MAZE	
20	23	GD-467	AGITATOR FOR FA-435	4/66		CT384		LIGHTNIN	
20	23	JU-405	SCREW FROM CALCINER TO COOLER	12/64		CT133	7025	J. EGAN & SONS	
20	23	JU-408A	SUBLIMER FEED SCREW CONVEYOR EA26A	1/65		CT155	9724	PHOENIX MACHINE FOUNDRY	
20	23	JU-408B	FEED SCREW FOR EA 26B	7/65		CT289			
20	23	JU-408C	ALUM. CHLORIDE SUBLIMER SCREW EA26C	3/67		CT389	18773	REEFE EQUIPMENT CO.	
20	23	PA-7	VIBRATOR FOR FE-6	3/73		33725	1582	CUTLER-HAMMER, INC.	
20	23	PA-15A	ROTARY AIR VALVES FOR FG-2S	12/64	LUMMUS	4978	1625	SPROUT WALDRON	
20	23	PA-16	ROTARY AIR VALVES FOR FG-2	12/64	LUMMUS	4978	1625	SPROUT WALDRON	
20	23	PA-17	ROTARY AIR VALVES FOR FE-6	12/64	LUMMUS	4978	1625	SPROUT WALDRON	
20	23	PA-18	ROTARY AIR VALVES FOR FE-6	12/64	LUMMUS	4978	1625	SPROUT WALDRON	
20	23	PA-36	TITANIUM DIOXIDE CALCINER	12/64	LUMMUS	4978	2526	BARTLETT-SNOW	
20	23	PA-37	TITANIUM DIOXIDE COOLER <i>see PA-36</i>	12/64	LUMMUS	4978	2526	BARTLETT-SNOW	
0	23	PA-40B	DAY BIN FOR EA-26B	4/72		CT916	7851	E & W SERVICES	
20	23	PA-45	ROTARY LOCK FOR FG-402 CYCLONE <i>see</i>	8/66		CT406			
20	23	PA-402A	EA-7 PURGE SYSTEM	12/64		CT095	3622	CABOT MACHINE DIV.	
20	23	PA-402B	EA-7 PURGE SYSTEM	12/64		CT095	3622	CABOT MACHINE DIV.	
20	23	PA-402C	EA-7 PURGE SYSTEM	12/64		CT095	3622	CABOT MACHINE DIV.	
20	23	PA-402D	EA-7 PURGE SYSTEM	12/64		CT095	3622	CABOT MACHINE DIV.	
20	23	PA-404A	ROTARY LOCK FOR FG-404A	12/64	LUMMUS	4978	1625	SPROUT-WALDRON	
20	23	PA-404B	ROTARY LOCK FOR FG-404B	12/64	LUMMUS	4978	1625	SPROUT-WALDRON	
20	23	PA-404C	ROTARY LOCK FOR FG-404C	7/65		CT159	8417	SPROUT-WALDRON	
20	23	PA-404D	ROTARY LOCK FOR FG-404D	7/65		CT159	8417	SPROUT-WALDRON	
20	23	PA-408E	ROTARY VALVES FOR FG-404E	12/66	MCKEE	CT404	3383	SPROUT-WALDRON	
20	23	PA-408F	ROTARY VALVES FOR FG-404F	12/66	MCKEE	CT404	3383	SPROUT-WALDRON	
20	23	PA-446	SYNTRON ROTARY VIBRATOR FOR FE-6	3/68		CT608		SYNTRON CLEVELAND SALES	
			SIZE R.V. 236						
20	23	PA-447	SYNTRON ROTARY VIBRATORS FOR FG404 & FG2	3/68		CT608		SYNTRON CLEVELAND SALES	
20	23	PA-452	FLUO-VEYOR AL2 CL6 SYSTEM	5/69		CT611	1997	DUCON CO.	
20	23	PA-454	ALUMINUM CHLORIDE DELUMPER	5/71		CT872	9324	E & W SERVICES	
20	23	PG-16	OXIDATION BURNER	12/64		CT146			

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EQUIPMENT COUNT AREA 23 99

UNIT AREA	EQUIP NBR	DESCRIPTION	DATE TO CONTRACTOR P&E	PROJ NBR	PO NBR	EQUIPMENT SUPPLIER	NOTES
*****CHLORINE RECOVERY							
20 24	BA-1	PARA-CYME VAPORIZER	12/64	4978	102	STRUTHERS WELLS	
20 24	DA-1	RICH CHLORINE ABSORBER	12/64	4978	400	STRUTHERS WELLS	
20 24	DA-3	CHLORINE DESORBER	12/64	4978	301	STEEL & ALLOY	
20 24	DA-4	CHLORINE ABSORPTION TOWER	7/69	CT695	7712	E & W SERVICES	
20 24	DA-403	CL2 ABSORPTION TOWER	1/65	CT114	6068	BUFFALO TANK DIVISION	
20 24	DA-404	KNOCKOUT POT	1/65	CT114	6119	MORGANTOWN-ORDINANCE WOR	
20 24	DA-406	H2S04 SCRUBBING TOWER	6/65	CT163	7569	MAURICE A. KNIGHT CO.	
20 24	DA-407	MIST ELIMINATOR H2S04 SYSTEM	6/65	CT163	7569	MAURICE A. KNIGHT CO.	
20 24	EA-12A	MONOCHLORIDE-DICHLORIDE EXCHANGERS	12/64	4978	400	STRUTHERS WELLS	
20 24	EA-12B	MONOCHLORIDE-DICHLORIDE EXCHANGERS	12/64	4978	400	STRUTHERS WELLS	
20 24	EA-12C	MONOCHLORIDE-DICHLORIDE EXCHANGERS	12/64	4978	400	STRUTHERS WELLS	
20 24	EA-12D	MONOCHLORIDE-DICHLORIDE EXCHANGERS	12/64	4978	400	STRUTHERS WELLS	
20 24	EA-13	DESORBER BOTTOMS COOLER	12/64	4978	400	STRUTHERS WELLS	
20 24	EA-14	DESORBER REBOILER	12/64	4978	400	STRUTHERS WELLS	
20 24	EA-17	VACUUM WATER CHILLER	12/64	4978	403	GRAHAM	
20 24	EA-23X	VENT CONDENSER WITH BA-1	12/64	4978	102	STRUTHERS WELLS	
20 24	EA-34X	VENT GAS CONDENSER WITH GC-1	12/64	4978	503	FRICK	
20 24	EA-35X	MOD ON CT407 10/67					
20 24	EA-36X	FREON REFRIG.-SUCTION HEAT EXCHANGER	12/64	4978	503	FRICK	
20 24	EA-37X	WITH GC-2					
20 24	EA-38X	FREON REFRIG.-OIL RECOVERY LINE EXCHANG	12/64	4978	503	FRICK	
20 24	EA-39X	WITH GC-2					
20 24	EA-40X	FREON REFRIG. CONDENSER	12/64	4978	503	FRICK	
20 24	EA-41X	CL2 AIR PADG COMP. INTERCOOLER	4/73	4978	6917	JOE DONNELLY	
20 24	EA-42X	CL2 AIR PADG COMP. INTERCOOLER	12/64	4978	510	WORTHINGTON CORP.	
20 24	EA-43X	CL2 AIR PADG COMP. AFTERCOOLER	12/64	4978		WORTHINGTON CORP.	
20 24	EA-44X	INTERCOOLER ON DA-403, 2ND STAGE	1/65	CT114	6134	STRUTHERS WELLS	
20 24	EA-45X	COOLER	1/65	CT114	6134	STRUTHERS WELLS	
20 24	EA-46X	COOLER	1/65	CT114	6134	STRUTHERS WELLS	
20 24	EA-47X	RECYCLE H2S04 ACID COOLERS	6/65	CT163	7569	MAURICE A. KNIGHT CO.	
20 24	EA-48X	RECYCLE H2S04 ACID COOLERS	6/65	CT163	7569	MAURICE A. KNIGHT CO.	
20 24	EA-49X	REFR. MONOCHLORIDE CHILLER	1/65	CT114	8058	FRICK CO.	
20 24	EA-50X	CHLORIDE CHILLER C SECTION	10/67	CT407		DOYLE & ROTH MFG. CO.	
20 24	EA-51X	CHLORIDE CHILLER	10/67	CT407		DOYLE & ROTH MFG. CO.	
20 24	EA-52X	CHLORINE VENT CONDENSER	10/67	CT407		AMERICAN HEAT	
20 24	EA-53X	CHLORINE CONDENSER-REPL. EA-441	10/67	CT407	26923	ENG. & FABR. INC.	
20 24	EA-54X	CHLORINE CONDENSER	1/70	CT704	825	DOONNELLY MFG. CO.	
20 24	EA-55X	INTERCOOLER ACCUMULATOR FOR GC-1	10/67	CT407		DOONNELLY MFG. CO.	
20 24	EA-56X	OIL RECOVERY FREON VAPORIZER	10/67	CT407		BROWN FINITUBE CO.	
20 24	EA-57X	CL2 COOLER	9/70	CT690	178	STRUTHERS WELLS	
20 24	EA-58X	VENT CONDENSER EJECTION	12/64	4978	102	BUFFALO TANK DIV.	
20 24	EA-59X	RICH LIQUID TANK	12/64	4978	303	BUFFALO TANK DIV.	
20 24	EA-60X	CHLORIDE SURGE TANK	12/64	4978	247	BUFFALO TANK DIV.	
20 24	EA-61X	MONOCHLORIDE SURGE TANK	12/64	4978	308	YOUNGSTOWN	
20 24	EA-62X	DESORBER REFLUX DRUM	12/64	4978	102	STRUTHERS WELLS	
20 24	EA-63X	PARACYME FLASH TANK	12/64	4978	102	STRUTHERS WELLS	
20 24	EA-64X	PARACYME SURGE TANK	12/64	4978	102	STRUTHERS WELLS	
20 24	EA-65X	PARACYME STORAGE TANK	12/64	4978	102	STRUTHERS WELLS	
20 24	EA-66X	CHLORINE VENT LIME TANK	12/64	4978	345	GOODRICH	

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UNIT	AREA	EQUIP NBR	DESCRIPTION	DATE TO PPGE	CONTRACTOR	PROJ NBR	PO NBR	EQUIPMENT SUPPLIER	NOTES
20	24	FA-48X	VENT GAS & RECEIVER W/GC-1 <i>see</i>	12/64	LUMMUS	4978	503	FRICK	
20	24	FA-49X	FREON REFRIG.-RECEIVER W/GC-2 <i>see</i>	12/64	LUMMUS	4978	503	FRICK	
20	24	FA-109X	CL2 PADDING RECEIVER W/GC-1 <i>see</i>	12/64	LUMMUS	4978	510	WORTHINGTON CORP.	
20	24	FA-408	RECEIVER FOR DA-4 LIQUID	1/65		CT114	5839	MORGANTOWN ORDINANCE WOR	
20	24	FA-412A	H2SO4 STORAGE TANK	6/65		CT163	7569	MAURICE A. KNIGHT	
20	24	FA-412B	H2SO4 STORAGE TANK	6/65		CT163	7569	MAURICE A. KNIGHT	
20	24	FA-470	OIL SKIMMING TANK FOR EA-414 & EA-432	10/67		CT407		CABOT	REMOVED
20	24	FA-472	FREON REFRIGERATION RECEIVER W/FA49X <i>see</i>	6/68		8749	3814	FRICK COMP.	
20	24	FB-7A	LIQUID CHLORINE STORAGE TANKS	12/64	LUMMUS	4978	304	GENERAL AMERICAN	
20	24	FB-7B	LIQUID CHLORINE STORAGE TANKS	12/64	LUMMUS	4978	304	GENERAL AMERICAN	
20	24	FB-7C	LIQUID CHLORINE STORAGE TANKS	12/64	LUMMUS	4978	304	GENERAL AMERICAN	
20	24	FB-7D	LIQUID CHLORINE STORAGE TANKS	12/64	LUMMUS	4978	304	GENERAL AMERICAN	
20	24	FB-103	INTERMEDIATE COOLING WATER STORAGE TANK	12/64	LUMMUS	4978	337	ALPHA TANK	
20	24	FD-7X	VENT. GAS CHILLER OIL SEPARTR WITH GC-1 <i>see</i>	12/64	LUMMUS	4978	503	FRICK	
20	24	FD-8X	FREON REFRIG. UNIT-OIL SEPARATOR W/GC-2 <i>see</i>	12/64	LUMMUS	4978	503	FRICK	
20	24	FD-9X	FREON REFRIG. UNIT-OIL SEPARATOR W/GC-2 <i>see</i>	12/64	LUMMUS	4978	503	FRICK	
20	24	FD-106X	OIL PREFILTR-CL2 AIR PADDG SYS W/KA-103	12/64	LUMMUS	4978	1001	TRINITY	
20	24	FD-107X	OIL AFTERFILTR-CL2 AIR PADDING SYSTEM WITH KA-103 <i>see</i>	12/64	LUMMUS	4978	1001	TRINITY	
20	24	FD-410X	OIL SEPARATOR WITH GC-401X GC2 PKG <i>see</i>	10/67		CT407		FRICK	
20	24	FD-422	SUCTION ACCUMULATOR W/GC2	8/71		9254		REFRIG. RESEARCH-MARSTON	
20	24	FG-7	CHLORINE GAS FILTER	12/64	LUMMUS	4978	350	ALPHA	
20	24	FG-101X	AIR INTAKE FILTER WITH GB-455 <i>see</i>	12/64	LUMMUS	4978	510	WORTHINGTON	
20	24	FG-401A	CHLORINE FILTER	12/64		CT089	2962	EMER PROD. CORP.	
20	24	FG-401B	LIQUID CL2 FEED FILTER	12/64		CT129	6493	WM. BERRINGTON & SON	
20	24	FG-402	H2SO4 FILTER	12/64		CT091		BUFFALO FORGE	RETIRED
20	24	GA-19A1	DESORBER FEED PUMPS	12/64	LUMMUS	4978	504	CHEMPUMP	
20	24	GA-19A2	DESORBER FEED PUMPS	12/64	LUMMUS	4978	504	CHEMPUMP	
20	24	GA-19B1	DESORBER FEED PUMPS	12/64	LUMMUS	4978	504	CHEMPUMP	
20	24	GA-19B2	DESORBER FEED PUMPS	12/64	LUMMUS	4978	504	CHEMPUMP	
20	24	GA-20A	RICH ABSORBER FEED PUMP - CHLOR.	12/64	LUMMUS	4978	504	CHEMPUMP	
20	24	GA-20B	RICH ABSORBER FEED PUMP - CHLOR.	12/64	LUMMUS	4978	504	CHEMPUMP	
20	24	GA-24A	CHILLED WATER PUMPS	12/64	LUMMUS	4978	507	GOULD PUMP	
20	24	GA-24B	CHILLED WATER PUMPS	12/64	LUMMUS	4978	507	GOULD PUMP	
20	24	GA-25A	DESORBER REFLUX PUMPS	12/64	LUMMUS	4978	504	CHEMPUMP	
20	24	GA-25B	DESORBER REFLUX PUMPS	12/64	LUMMUS	4978	504	CHEMPUMP	
20	24	GA-25C	DESORBER REFLUX PUMPS	12/64	LUMMUS	4978	504	CHEMPUMP	
20	24	GA-30AX	PARACYMENE CONDENSATE PMP & SP W/BA-1	12/64	LUMMUS	4978	102	STRUTHERS-WELLS	
20	24	GA-30BX	PARACYMENE CONDENSATE PMP & SP W/BA-1	12/64	LUMMUS	4978	102	STRUTHERS-WELLS	
20	24	GA-31AX	PARACYMENE CIRCULATING PUMP WITH BA-1	12/64	LUMMUS	4978	102	STRUTHERS-WELLS	
20	24	GA-32X	CHARGE PUMP WITH BA-1 <i>see</i>	12/64	LUMMUS	4978	102	STRUTHERS WELLS	
20	24	GA-123	INTERMEDIATE COOLG WATR PUMP TO C TOWER	12/64	LUMMUS	4978	514	GOULD	
20	24	GA-404A	PUMP ON FA-408	1/65		CT114	5371	CHEMICAL PUMP & EQUIPMEN	
20	24	GA-404B	PUMP ON FA-408	1/65		CT114	5880	CHEMICAL PUMP & EQUIPMEN	
20	24	GA-405A	PUMP ON FA-12	1/65		CT114	6133	CHEMPUMP	
20	24	GA-405B	PUMP ON FA-12	1/65		CT114	6133	CHEMPUMP	
20	24	GA-411A	H2SO4 PUMPS	6/65		CT163		CHEMPUMP	
20	24	GA-411B	H2SO4 PUMPS	6/65		CT163		CHEMPUMP	
20	24	GA-480	SULPHUR CHLORIDE CIRC. PUMP FA-13	5/68		CT602		CRANE CHEMPUMP	
20	24	GA-480S	SULPHUR CHLORIDE CIRC. PUMP FA-13	5/68		CT602		CRANE CHEMPUMP	
20	24	GA-501A	AUXILIARY OIL PUMP ON GD-10 <i>see</i>	12/64	LUMMUS	4978			

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UNIT	AREA	EQUIP NBR	DESCRIPTION	DATE TO PP&E	CONTRACTOR NBR	PROJ NBR	PD NBR	EQUIPMENT SUPPLIER	NOTES
20	24	GA-501B	AUXILIARY OIL PUMPS ON GB-10 <i>sub 2</i>	12/64		CT127			
20	24	GA-501C	AUXILIARY OIL PUMPS ON GB-10 <i>sub 2</i>	12/64		CT127			
20	24	GB-10A	CL2 RECOVERY COMPRESSOR	12/64	LUMMUS	4978	506	SUTORBILT	
20	24	GB-10B	CL2 RECOVERY COMPRESSOR	12/64		CT127	506	SUTORBILT	
20	24	GB-10C	CL2 RECOVERY COMPRESSOR	12/64		CT127	506	SUTORBILT	
20	24	GA-411	PURGE BLOWER PARACUMENE HEATER <i>see BA-2</i>	12/64		CT113	5068	STRUTHERS WELLS	
20	24	GB-455	PADDING AIR COMPRESSOR QUINCY	9/71		CT904	3485	EARL E. KNOX CO.	
20	24	GC-1	FREON COMPRESSOR	12/64	LUMMUS	4978	503	FRICK	
20	24	GC-5X	FREON COMPRESSOR GC-2 PACKAGE	12/64	LUMMUS	4978	503	FRICK	
20	24	GC-6X	FREON COMPRESSOR GC-2 PACKAGE	12/64	LUMMUS	4978	503	FRICK	
20	24	GC-401X	FREON COMPRESSOR GC-2 PACKAGE	10/67		CT407		FRICK	
20	24	GD-14	AGITATOR FOR FA-25	12/64	LUMMUS	4978	509	CHEMINEER	
20	24	KA-103	CL2 AIR PAD DRYER FOR GB-455	12/64	LUMMUS	4978	1000	TRINITY	
20	24	KA-473	FREON DRIER <i>1/GC2 see GC-2</i>	8/71		9254		TEMPRITE MARSTON CO.	

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*****AFTERTREATMENT									
20	25	BA-408	IN-FRA RED GAS HEATERS FOR FB-3B	9/71		CT862	9357	DETROIT RADIANT PRODUCTS	
20	25	BA-409	STEAM HEATER FOR TANK FB3A			CT909			
20	25	BA-410	HEATER FOR FG-4 WASII WATER	9/71		CT903	5199	GOOD TECH-PEMBICY HEATR	
20	25	BH-1A	FLUID ENERGY MILL STEAM FILTER <i>see PA-5A</i>	12/64	LUMMUS	4978	323	PALL CORP.	
20	25	BH-1B	FLUID ENERGY MILL STEAM FILTER <i>see PA-5B</i>	12/64	LUMMUS	4978	323	PALL CORP.	
20	25	BH-1C	FLUID ENERGY MILL STEAM FILTER <i>see PA-5C</i>	12/64	LUMMUS	4978	323	PALL CORP.	
20	25	BH-3	FILTR FOR STEAM SPARGE HEADR WAT BLDG	12/64		CT099	5084	PALL CORP.	
20	25	EA-10A	ENERGY MILL STEAM CONDENSERS	12/64	LUMMUS	4978	400	STRUTHERS WELLS	
20	25	EA-10B	ENERGY MILL STEAM CONDENSERS	12/64	LUMMUS	4978	400	STRUTHERS WELLS	
20	25	EA-10C	ENERGY MILL STEAM CONDENSERS	12/64	LUMMUS	4978	400	STRUTHERS WELLS	
20	25	EA-304	TICL4 SOLUTION COOLER	12/64	LUMMUS	5246	401	KEARNEY IND.	
20	25	EA-460	AIR PREHEATER FOR JD-25	9/70		CT857	5393	TOWERS & MYERS	
20	25	EA-461A	HOT WATER COIL FOR FB3A			CT909			
20	25	EA-461B	HOT WATER COIL FOR FB3A			CT909			
20	25	FA-4A	INTERMEDIATE SLURRY STORAGE TANK	12/64	LUMMUS	4978	345	GOODRICH	RETIRED
20	25	FA-4B	CONTINUOUS DISPERSION TANK	12/64	LUMMUS	4978	345	GOODRICH	
20	25	FA-5	1ST DISPERSION TANK PA-37 BY PASS	2/70		CT744			IDLE
20	25	FA-29	FILTER HEAD TANK	12/64	LUMMUS	4978	317	PROTECTIVE COATINGS	IDLE
20	25	FA-30	STEAM CONDENSATE SURGE TANK	3/68		CT603		E & W SUPPLY	
20	25	FA-31X	THICKENER WITH G-3 G-4 <i>see PA-31X</i>	12/64	LUMMUS	4978	321	DORR-OLIVER	
20	25	FA-32X	FILTRATE RECEIVER <i>see PA-32X</i>	12/64	LUMMUS	4978	321	DORR-OLIVER	
20	25	FA-33X	MOTHER LIQUOR RECEIVER <i>see PA-33X</i>	12/64	LUMMUS	4978	321	DORR-OLIVER	
20	25	FA-34X	FILTRATE RECEIVER <i>see PA-34X</i>	12/64	LUMMUS	4978	321	DORR-OLIVER	
20	25	FA-40	ACCUMULATIVE SLURRY TANK	12/64	LUMMUS	4978	338	PROTECTIVE COATING	
20	25	FA-41	SLURRY SURGE TANK	12/64	LUMMUS	4978	338	PROTECTIVE COATING	
20	25	FA-42	ALUMINA TREATMENT TK	12/64	LUMMUS	4978	333	PROTECTIVE COATING	
20	25	FA-43	H2SO4 TREATMENT TANK	12/64	LUMMUS	4978	333	PROTECTIVE COATING	
20	25	FA-44	HOLDING TANK	12/64	LUMMUS	4978	333	PROTECTIVE COATING	
20	25	FA-306	TICL4 DISSOLVER TANK	12/64	LUMMUS	5246	300	BROADWAY RUBBER	
20	25	FA-307A	TEA DAY TANK	12/64	LUMMUS	5246	504	B.I.F. INDUSTRIES	IDLE
20	25	FA-307B	TEA DAY TANK	12/64	LUMMUS	5246	504	B.I.F. INDUSTRIES	IDLE
20	25	FA-411	SEPARAN TANK	12/64		CT115	5959	MORGANTOWN ORDINANCE WRK	
20	25	FA-428A	OVERSIZE RECEIVER FOR PA-428A/B	3/66		CT371	17453	HINKEL	
20	25	FA-428B	OVERSIZE RECEIVER FOR PA-428A/B	3/66		CT371	17453	HINKEL	
20	25	FA-429	PA-3 OVERFLOW	3/66		CT371	17453	HINKEL	
20	25	FA-430	PRODUCT OVERFLOW TANK	3/66		CT371			
20	25	FA-431	UNDERSIZE DISCHARGE TANK FOR PA-428	4/66		CT395	13199	ARTHUR LOUIS STEEL	REMOVED
SEE CT-250									
20	25	FA-445	SODA ASH DILUTION TANK	7/67	MCKEE	CT415	3383	BUFFALO TANK DIVISION	
20	25	FA-482	OFF-QUALITY DISPERSION TANK	7/70		CT837	6509	CELCOTE CO., INC.	
20	25	FA-484	SURGE TANK FOR CALCINER BY-PASS			CT893	3693	CURIFAC, INC.	
20	25	FA-485A	MIX TK FOR CALCINER BY-PASS SOD SILICATE			CT893	3691	MOONEY PROCESS	
20	25	FA-485B	MIX TK FOR CALCINER BY-PASS SODA ASH			CT893	3691	MOONEY PROCESS	
20	25	FA-486	ACID REPULPING TANK S.S.	8/69		CT702	4098	UNITED UTENSIL CO.	
20	25	FA-487	COWLES DISSOLVR SLURRY MIX SEE WD5022	5/72		CT893		MOREHOUSE-COWLES	
20	25	FA-501	SURFACTANT MIX TANK-SEE 7125	10/70		CT863			
20	25	FA-502	SURFACTANT HOLD TANK-SEE 7125	10/70		CT863			
20	25	FB-2	SLURRY STORAGE TANK SODA ASH	12/64	LUMMUS	4978	2510	PITTS-DEMOINE	
20	25	FB-3A	SOD SILICATE STORAGE TANK	12/64	LUMMUS	4978	345	GOODRICH	

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UNIT	AREA	EQUIP NBR	DESCRIPTION	DATE TO P&E	CONTRACTOR	PROJ NBR	PO NBR	EQUIPMENT SUPPLIER	NOTES
20	25	FB-38	SODIUM ALUMINATE STORAGE TANK SEE CT-862	12/64	LUMMUS	4978	345	GOODRICH	
20	25	FB-301	HCL STORAGE TANK	12/64	LUMMUS	5246	300	BROADWAY RUBBER	IDLE
20	25	FB-302	HEXOIC ACID STORAGE TK	12/64	LUMMUS	5246	308	VULCAN MFG.	
20	25	FB-441	GRADE I SLURRY STORAGE TANK 100,000 GAL	8/67	MCKEE	CT414	3383	CHICAGO BRIDGE & IRON	
20	25	FB-442	GRADE II SLURRY STORAGE TANK 100,000 GAL	8/67	MCKEE	CT414	3383	CHICAGO BRIDGE & IRON	
20	25	FB-443	TREATMENT AREA STORAGE TANK 100,000 GAL	8/67	MCKEE	CT414	3383	CHICAGO BRIDGE & IRON	
20	25	FB-450	HEXOIC ACID STORAGE TK						
20	25	FB-470	3400 GAL. SULFURIC ACID TANK	8/69		CT702	4092	YOUNGSTOWN STEEL TANK	
20	25	FB-472A	HOT WATER TANK FOR HEATER EA-461	11/24		CT909	6627	MOONEY PROCESS EQUIP.	
20	25	FB-472B	HOT WATER TANK FOR HEATER EA-461	11/24		CT909	6627	MOONEY PROCESS EQUIP.	
20	25	FC-10	FLUID ENERGY MILL COOLG CONVEYR CYCLONE	12/64	LUMMUS	4978	332	STEEL ENTERPROSE CO.	
20	25	FD-10A	SILENCERS WITH GA-35X	12/64	LUMMUS	4978	321	DORR-OLIVER	
20	25	FD-10B	SILENCERS WITH GA-35X <i>see FG-3</i>	12/64	LUMMUS	4978	321	DORR-OLIVER	
20	25	FD-415	BASKET STRAINER FOR GA-424 PUMP <i>see</i>	7/70		CT837		HOMEMADE	
20	25	FD-416	SODIUM SILICATE FILTER	7/70		CT838	5394	WM. BERRINGTON-FILTERITE	
20	25	FD-417	SODIUM ALUMINATE FILTER	7/70		CT838	5394	WM. BERRINGTON-FILTERITE	
20	25	FD-418A	SODA ASH FILTERS	7/70		CT838	5394	WM. BERRINGTON-FILTERITE	
20	25	FD-418B	SODA ASH FILTERS	7/70		CT838	5394	WM. BERRINGTON-FILTERITE	
20	25	FD-419	AQUEOUS TICL4 SOLUTION FILTER	7/70		CT838	5394	WM. BERRINGTON-FILTERITE	
20	25	FD-420	SLURRY DUPLEX STRAINER FOR GA-419 <i>see</i>	7/70		CT838	5437	DECKER-REICHERT-HAYWOOD	
20	25	FD-421	SLURRY DUPLEX STRAINER FOR GA-42 <i>see</i>	7/70		CT838	5437	DECKER-REICHERT-HAYWOOD	
20	25	FE-3A	SURGE BINS	12/64	LUMMUS	4978	312	HEMMINGER	
20	25	FE-3B	SURGE BINS	12/64	LUMMUS	4978	312	HEMMINGER	
20	25	FE-3C	SURGE BINS	12/64	LUMMUS	4978	312	HEMMINGER	
20	25	FG-3	WASHING ROTARY FILTER	12/64	LUMMUS	4978	321	DORR-OLIVER	
20	25	FG-4	WASHING ROTARY FILTER	12/64	LUMMUS	4978	321	DORR-OLIVER	
20	25	FG-11X	VACUUM CLEANING SECONDARY COLLECTOR W/PA-30	12/64	LUMMUS	4978	1618	HOFFMAN	
20	25	FG-14	FLUID ENERGY MILL COOLING CONVEYDR BAG FILTER	12/64	LUMMUS	4978	318	PULVERIZING MACHINE CO.	
20	25	FG-15	FLUID ENERGY MILL COOLING CONVEYR AIR INLET FILTER - <i>see FG-14</i>	12/64	LUMMUS	4978	349	BURGESS-MANNING	
20	25	FG-19X	PRIMARY COLLECTOR VACUUM CLEANING	12/64	LUMMUS	4978	1618	HOFFMAN	
20	25	GA-2	SODA ASH CIRCULATING PUMP	12/64	LUMMUS	4978	507	GOULD PUMP	
20	25	GA-9A	SOD ALUMINATE TRANSFER PUMP	12/64	LUMMUS	4978	507	GOULD PUMP	
20	25	GA-9B	SOD ALUMINATE TRANSFER PUMP	12/64	LUMMUS	4978	507	GOULD PUMP	
20	25	GA-15X	FILTRATE PUMPS WITH FG-4 <i>see</i>	12/64	LUMMUS	4978	321	DORR-OLIVER	
20	25	GA-17X	FILTRATE PUMP WITH FG-3 <i>see</i>	12/64	LUMMUS	4978	321	DORR-OLIVER	
20	25	GA-32	CONDENSATE CIRCULATING PUMP	12/64	LUMMUS	4978	513	DORR-OLIVER	
20	25	GA-33X	MOTHER LIQUOR PUMP WITH FG-4 <i>see</i>	12/64	LUMMUS	4978	321	DORR-OLIVER	
20	25	GA-35X	VACUUM PUMP WITH FG-3 <i>see</i>	12/64	LUMMUS	4978	321	DORR-OLIVER	
20	25	GA-41	ACCUMULATIVE SLURRY PUMP <i>see FG-3</i>	12/64	LUMMUS	4978	508	DORR-OLIVER	
20	25	GA-42A	SLURRY SURGE TANK DISCHARGE PUMPS FA41	12/64	LUMMUS	4978	524	GALIGHER PUMP	
20	25	GA-42B	SLURRY SURGE TANK DISCHARGE PUMPS FA41	12/64	LUMMUS	4978	524	GALIGHER PUMP	
20	25	GA-302	TICL4 SOLUTION PUMP	12/64	LUMMUS	5246	500	DORR-OLIVER	
20	25	GA-302S	TICL4 SOLUTION PUMP	3/70		CT764		DORR-OLIVER	
20	25	GA-303A	TEA PROPORTIONING PUMP	12/64	LUMMUS	5246	504	B.I.F. INDUSTRIES	IDLE
20	25	GA-303B	TEA PROPORTIONING PUMP	12/64	LUMMUS	5246	504	B.I.F. INDUSTRIES	IDLE
20	25	GA-409	SEPARAN ADDITION PUMP	12/64		CT115		BILLERICA	
20	25	GA-412	HCL PUMP	8/65		CT166	9627	WORTHINGTON CORP.	IDLE

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20	25	GA-413	SOD SILICATE PUMPS GEAR PUMP	8/65		CT166	9627	WORTHINGTON CORP.	
20	25	GA-413S	SODIUM SILICATE PUMP GEAR PUMP	4/70		CT746	3088	PRODCO EQUIPMENT	
20	25	GA-419	TIO2 SLURRY PUMP - FA4B	3/65		CT186	10519	ALLEN PUMP CO.	
20	25	GA-419S	TIO2 SLURRY PUMP SPARE FA4B	7/65		CT245	12985	ALLEN PUMP CO.	
20	25	GA-430	CIRCULATING PUMP-FA-40	1/66		CT361		LAWRENCE PUMP	REMOVED
20	25	GA-431	CIRCULATING PUMP-FA-44	1/66		CT360		LAWRENCE PUMP	REMOVED
20	25	GA-433	H. E. SLURRY PUMP	3/66		CT371	17452	DORR-OLIVER	
20	25	GA-435	UNDERSIZE DISCHARGE PUMP	4/66		CT395	18406	DORR-OLIVER	
20	25	GA-441	SLURRY PUMP ON FB-441	8/67	MCKEE	CT414	3383	GALIGHER PUMP CO.	
20	25	GA-441S	SLURRY PUMP ON FB-441	7/70		CT765	4165	ALLEN PUMP CO.	
20	25	GA-443A	SLURRY PUMP-FB-443	8/67	MCKEE	CT414	3383	GALIGHER PUMP CO.	
20	25	GA-443S	SLURRY PUMP-FB-443	8/67	MCKEE	CT414	3383	GALIGHER PUMP CO.	
20	25	GA-445A	PRODUCT SLURRY PUMP-FA-431	7/67	MCKEE	CT413	3383	GALIGHER PUMP CO.	
20	25	GA-446A	FILTER CHARGE PUMP - FA-44	7/67	MCKEE	CT415	3383	GALIGHER PUMP CO.	
20	25	GA-446S	FILTER CHARGE PUMP - FA-44	7/67	MCKEE	CT415	3383	GALIGHER PUMP CO.	
20	25	GA-448A	SODA ASH TRANSFER FB-2	7/67	MCKEE	CT415	3383	WILFLEY PUMP CO.	
20	25	GA-448S	SODA ASH TRANSFER FB-2	7/67	MCKEE	CT415	3383	WILFLEY PUMP CO.	
20	25	GA-449	SLURRY TRANSFER FROM FA-5	2/70		CT744		CHEMICAL PUMP & EQUIPMEN	IDLE
20	25	GA-450	HEXOIC ACID TRANSFER PUMP						
20	25	GA-459	THICKENER BOTTOMS RECYCLE PUMP	5/67	MCKEE	CT408	3383	ALLEN PUMP CO.	
20	25	GA-475	DILUTE SODA ASH PUMP	7/67		CT415	15283	TELCO FROM CT-219	
20	25	GA-493A	SLURRY DENSITY CELL PUMP CALCINR COOLR	2/70		CT744	5446	ROBBINS & MEYERS	IDLE
20	25	GA-493S	SLURRY DENSITY CELL PUMPCALCINER COOLR	6/71		CT864	9721	ROBBINS & MEYERS	IDLE
20	25	GA-494	OFF-QUALITY SLURRY PUMP	7/70		CT837	7133	CHEMICAL PUMP & EQUIPMEN	
20	25	GA-495	ACID TRANSFER PUMP FROM FB470	8/69		CT702		BIF	
20	25	GA-496	ACID TRANSFER PUMP FB470	3/70		CT783	7867	BIF	
20	25	GA-499	SODIUM ALUMINATE PUMP TO FB-3B	9/71		CT862		VIKING PUMP CO.	
20	25	GA-500A	SURFACTANT ADDITION PUMP	10/70		CT863	2240	BIFF METERNG PMP F BOWER	
20	25	GA-500B	SURFACTANT ADDITION PUMP	10/70		CT863	2240	BIFF METERNG PMP F BOWER	
20	25	GA-500C	SURFACTANT ADDITION PUMP	9/71		CT883		BOWERS COMPANY	
20	25	GA-503A	CALCINER BY-PASS SLURRY PUMPS	5/72		CT893	3627	GALIGHER ALLEN PUMP CO.	
20	25	GA-503B	CALCINER BY-PASS SLURRY PUMPS	5/72		CT893	3627	GALIGHER ALLEN PUMP CO.	
20	25	GA-504A	CALCINER BY-PASS ADDITIVE PUMPS	5/72		CT893	3627	ALLEN PUMP CO. SCOT MODE	
20	25	GA-504B	CALCINER BY-PASS ADDITIVE PUMPS	5/72		CT893	3627	ALLEN PUMP CO. SCOT MODE	
20	25	GA-505A	CALCINER BY-PASS SLURRY PUMPS FA-4A	5/72		CT893		GALIGHER	
20	25	GA-505B	CALCINER BY-PASS SLURRY PUMPS FA-4A	5/72		CT893		GALIGHER	
20	25	GA-506	CALCINER BY-PASS H2SO4 PUMP AT FA4B	7/71		CT893	4350	BIFF 1700	
20	25	GA-508	H2SO4 TREATMENT PUMP	3/72				BIFF	
20	25	GA-518	SURFACTANT TRANSFER PUMP	9/71		CT883		BIF-BOWERS	
20	25	GA-519	HOT WATER PUMP FOR TANK FB-472	12/71		CT909	6496	REL. & GOSSET	
20	25	GB-19X	VACUUM CLEANING EXHAUSTER W/PA-30	12/64	LUMMUS	4978	1618	HOFFMAN	
20	25	GB-23	EXHAUSTER FOR ENERGY MILL COOLG CONVEYR	12/64	LUMMUS	4978	515	DUFFALO FORGE	
20	25	GB-25X	AIR SLIDE CONVEYOR BLOWER	12/64	LUMMUS	4978	903	FULLER CO.	REMOVED
20	25	GB-26X	AIR SLIDE CONVEYOR BLOWER	12/64	LUMMUS	4978	903	FULLER CO.	
20	25	GB-29X	AIR SLIDE CONVEYOR BLOWER	12/64	LUMMUS	4978	903	FULLER CO.	REMOVED
20	25	GB-447	EXHAUST FAN FROM FA-5, PA-37 BY-PASS	2/70		CT744			IDLE
20	25	GB-451A	EXHAUST BLOWER FOR FG-3 HOOD	10/70		CT802	7812	SARGENT ENG. CO.	
20	25	GB-451B	EXHAUST BLOWER FOR FG-4 HOOD	10/70		CT802	7812	SARGENT ENG. CO.	
20	25	GB-453	EXHAUST BLOWER FOR CALCINER BY-PASS	5/72		CT893		COROFAC	
20	25	GB-16X	THICKENER MECHANISM <del>W/FA-31X</del>	12/64	LUMMUS	4978	321	DORR-OLIVER	
20	25	GB-17	AGITATOR FOR FA-41	12/64	LUMMUS	4978	509	CHEMINEER	

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20	25	GD-19	AGITATOR FOR FA-43	12/64	LUMMUS	4978	509	CHEMINEER	
20	25	GD-20	AGITATOR FOR FA-44	12/64	LUMMUS	4978	509	CHEMINEER	
20	25	GD-23	AGITATOR FOR FA-40	12/64	LUMMUS	4978	509	CHEMINEER	
20	25	GD-401	SEPARAN TANK AGITATOR	12/64		CT115	6235	CHEMINEER	
20	25	GD-403	AGITATOR FOR FA-42	11/65		CT325	14738	CHEMINEER	
20	25	GD-425	AGITATOR FOR FA-431	4/66		CT395		LIGHTNIN	
20	25	GD-428A	AGITATOR FOR FA-428A	4/66		CT395	18377	SEE COMMENTS	
			SUPPLIER-MIXING EQ.3 WALDRIP BLANKENBURG						
20	25	GD-428B	AGITATOR FOR FA-428B	8/66		CT401	18377	SEE COMMENTS	
			SUPPLIER-MIXING EQ.3 WALDRIP-BLANKENBURG						
20	25	GD-429	AGITATOR FOR FA-429	4/66		CT395	18377	SEE COMMENTS	
			SUPPLIER-MIXING EQ.2 WALDRIP BLANKENBURG						
0	25	GD-430	AGITATOR FOR FA-40	4/66		CT353	16652	PHILADELPHIA GEAR	
20	25	GD-432	AGITATOR FOR FA-5	8/65		CT283	13996	CLEVELAND MIXER	IDLE
			SEE CT-744						
20	25	GD-441	AGITATOR FOR FB-441	8/67		CT414		PHILADELPHIA GEAR	
20	25	GD-442	AGITATOR FOR FB-442	8/67		CT414		PHILADELPHIA GEAR	
20	25	GD-443	AGITATOR FOR FB-443	7/67		CT413		PHILADELPHIA GEAR	
20	25	GD-447	AGITATOR FOR FA-42 INLET	7/66		CT399	10522	DENVER TELCO	
20	25	GD-472	AGITATOR FOR FA-482	7/70		CT837	8661	WALDRIP-BLANKENBURG & CO	
			SEE WD 7133						
20	25	GD-474	AGITATOR FOR FA487	5/72		CT893		MOREHOUSE-COWLES	
20	25	GD-475	PORTABLE AGITATOR FOR FA-485A/B	5/72		CT893	3628	MIXING EQUIP.	
20	25	GD-484	AGITATOR FOR FA484	5/72		CT893		LIGHTNING MIXER	IDLE
20	25	GD-490	AGITATOR FOR SURFACTANT HOLD TK FA502	10/70		CT863			
			SEE W.O. 7125						
20	25	GD-491	AGITATOR FOR SURFACTANT MIX TANK FA501	10/70		CT863			
			SEE W.O. 7125						
20	25	GD-492	AGITATOR FOR ACID REPULPING TANK FA486	8/69		CT702	4097	MIXING EQUIP CO.	
20	25	GD-493	DRAFT TUBE AGITATOR FA43					LIGHTNING MIXER	
20	25	JD-10	APRON DRYER	12/64	LUMMUS	4978	902	PROCTOR & SCHWARTZ	
20	25	JD-11	BUCKET ELEVATOR GRANULATED TIO2	12/64	LUMMUS	4978	1612	BARTLETT-SNOW	
20	25	JD-13A	GRAVIMETRIC FEEDER TO GET MILL	2/69		CT668	5263	WALLACE & TIERNAN, INC.	
0	25	JD-13B	GRAVIMETRIC FEEDER TO GET MILL	2/69		CT668	5263	WALLACE & TIERNAN, INC.	
20	25	JD-13C	GRAVIMETRIC FEEDER TO GET MILL	2/69		CT668	5263	WALLACE & TIERNAN, INC.	
20	25	JD-17A	8IN SCREW CONVEYOR TO SURGE BINS	12/64	LUMMUS	4978	1612	BARTLETT-SNOW	
20	25	JD-17B	12IN SCREW CONVEYOR TO SURGE BINS	5/71		CT811	8565	THOMAS CONVEYOR CO.	
20	25	JD-23	SCREW CONVEYOR FA 10 TO ELEVATOR JD-11	12/64	LUMMUS	4978	1612	BARTLETT-SNOW	
20	25	JD-25	AIR CONVEYOR TO FC-10	12/64	LUMMUS	4978			
20	25	JD-26	CALCINER COOLER BUCKET ELEV.	12/64	LUMMUS	4978	1612	BARTLETT-SNOW	
20	25	JD-42	12IN SCREW CONVEYOR TO SURGE BINS	5/71		CT811	8565	THOMAS CONVEYOR CO.	
20	25	JD-302	SCREW CONVEYOR - DRY SYSTEM	12/64	LUMMUS	5246	1672	BARTLETT-SNOW	
20	25	JD-303	SCREW CONVEYOR 12IN DRY SYSTEM	7/65		CT244	13209	BARTLETT-SNOW	
20	25	JD-304	BUCKET ELEVATOR - DRY SYSTEM	12/64	LUMMUS	4978	1672	BARTLETT-SNOW	
20	25	JD-409	OFF-QUALITY SCREW CONVEYOR PORTABLE	12/64		CT181	10562	REEFE EQUIPMENT CO.	
20	25	JD-426	SLIDE BELT CONVEYOR TO PACKING BINS	1/67		CT563	22183	WICKLIFF SERVICES	
			SEE W.O. 7015						
20	25	JD-458	9IN SCREW CONVEYOR-PRODUCT FROM PA-409	10/69		CT696		DERRICK SCREEN	
20	25	JD-459	9IN SCREW CONVEYOR-PRODUCT FROM PA-409	10/69		CT696		DERRICK SCREEN	
20	25	JD-461	9IN SCREW CONVEYOR W/FA-5	2/70		CT744		CABOT	IDLE
20	25	JD-463	12IN SLIDE BELT CONVEYOR	5/71		CT801		E & W SERVICES	

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			FROM FC-10 & FG-14 TO FE-4A&B						
20	25	<del>PA-2X</del>	REPULPER WITH FILTER FC-3 <i>see FG-3</i>	12/64	LUMMUS	4978	321	DORR-OLIVER	
20	25	<del>PA-3</del>	BATCH FEED PEBBLE MILL	12/64	LUMMUS	4978	1601	PATTERSON	
20	25	<del>PA-5A</del>	FLUID ENERGY MILL	12/64	LUMMUS	4978	1621	JET PULVERIZER	
20	25	<del>PA-5B</del>	FLUID ENERGY MILL	12/64	LUMMUS	4978	1621	JET PULVERIZER	
20	25	<del>PA-5C</del>	FLUID ENERGY MILL	12/64	LUMMUS	4978	1621	JET PULVERIZER	
20	25	<del>PA-10A</del>	ROTARY AIR VALVES FOR PA-5A/B/C	12/64	LUMMUS	4978	1625	SPROUT-WALDRON	
20	25	<del>PA-10B</del>	ROTARY AIR VALVES FOR PA-5A/B/C	12/64	LUMMUS	4978	1625	SPROUT-WALDRON	
20	25	<del>PA-10C</del>	ROTARY AIR VALVES FOR PA-5A/B/C	12/64	LUMMUS	4978	1625	SPROUT-WALDRON	
20	25	<del>PA-30</del>	VACUUM CLEANING SYSTEMS	12/64	LUMMUS	4978	1619	HOFFMAN	
20	25	<del>PA-39A</del>	INTERNAL BIN ACTIVATOR FOR FE-3A/B/C	12/64	LUMMUS	4978	1615	VIGRA SCREW	
20	25	<del>PA-39B</del>	INTERNAL BIN ACTIVATOR FOR FE-3A/B/C	12/64	LUMMUS	4978	1615	VIGRA SCREW	
20	25	<del>PA-39C</del>	INTERNAL BIN ACTIVATOR FOR FE-3A/B/C	12/64	LUMMUS	4978	1615	VIGRA SCREW	
20	25	<del>PA-42</del>	ROTARY AIR VLV FC-10	12/64	LUMMUS	4978	1625	SPROUT-WALDRON	
20	25	<del>PA-48</del>	ROTARY AIR VALVE FOR FG-14	12/64	LUMMUS	4978	1625	SPROUT-WALDRON	
20	25	<del>PA-105</del>	DESUPERHEATER - WAT BLDG <i>see PA-5A</i>	12/64	LUMMUS	4978	1648	SCHUTTE-KOERTING	
20	25	<del>PA-312</del>	TEA PUMPING UNIT	12/64	LUMMUS	5246	504	H. R. BOWERS COMPANY	IDLE
20	25	<del>PA-409</del>	PRODUCT SCREEN EXIT	10/69		CT696	9678	DEKRICK MFG. CORP.	
20	25	<del>PA-413</del>	REBURN HOPPER	2/65		CT178	12523	NON-FERROUS METALS FAB.	
20	25	<del>PA-428A</del>	CENTRIFUGE BIRD	8/66		CT401	18543	BIRD	
20	25	<del>PA-428B</del>	CENTRIFUGE BIRD	8/66		CT401	18543	BIRD	
20	25	<del>PA-435</del>	STEAM EDUCTOR TO FA-42 <i>see FA-42</i>	7/67		CT415			
20	25	<del>PA-436</del>	DENSITY CELL FA-4B <i>see FA-45</i>	7/67	MCKEE	CT415	3383	CEILCOTE COMPANY	
20	25	<del>PA-431</del>	DENSITY CELL FA-31X <i>see FA-31X</i>	7/67		CT415			
20	25	<del>PA-442</del>	DENSITY CELL FA-431 <i>see FA-431</i>	3/66		CT371		PLANT MAINTENANCE	
20	25	<del>PA-454</del>	OFF-QUALITY PRODUCT SCREEN WAS PA409	12/64		CT181	9562	DERRICK MFG. CORP.	
20	25	<del>PA-457</del>	DELUMPER BETWEEN JD-11 & JD-42	5/71		CT870	9160	E & W SERVICES	
20	25	<del>PA-460</del>	CALCINER BY-PASS DIVERTER VALVE <i>see FA-460</i>			CT943			
20	25	<del>PA-462</del>	SLURRY SCREEN BETWEEN PA428 & FA41	8/72		05001	9187	DERRICK MFG CORP	
20	25	<del>PA-471</del>	SODA ASH MIXING TEE FB2 <i>see FB-2</i>						
20	25	<del>PA-472</del>	DIVERTER VLV JD-426 <i>see JD-426</i>	1/67		CT563		E & W SERVICES	

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*****OXIDE GENERAL									
20	29	EF-2	COOLING TOWER H2O	5/67		CT308	14832	FLUOR PRODUCTS CO.	
20	29	FJ-462	DIESEL STORAGE TANK FOR GA-455	3/67		CT463	22677	WORTHINGTON	
20	29	GA-109A	FIRE WATER PUMP	12/64	LUMMUS	4978	514	GOULD PUMP	
20	29	GA-109B	FIRE WATER PUMP	12/64	LUMMUS	4978	514	GOULD PUMP	
20	29	GA-416A	COOLING WATER RECIRC. PUMP	7/65		CT159	10380	GOULD PUMP	
20	29	GA-416S	COOLING WATER RECIRC. PUMP	5/67		CT308	19981	GOULD PUMP	REMOVED
20	29	GA-429A	COOLING TOWER H2O PUMPS	5/67		CT308	17140	WORTHINGTON CORP.	
20	29	GA-429B	COOLING TOWER H2O PUMPS	5/67		CT308	17140	WORTHINGTON CORP.	
20	29	GA-429C	COOLING TOWER H2O PUMPS	5/67		CT308	17140	WORTHINGTON CORP.	
20	29	GA-429S	COOLING TOWER H2O PUMPS	5/67		CT308	17140	WORTHINGTON CORP.	
0	29	GA-455	EMERGENCY WATER PUMP	3/67		CT463	22677	WORTHINGTON	
20	29	<del>GA-432A</del>	COOLING TOWER FAN <i>see EF.2</i>	5/67		CT308	14832	FLUOR	
20	29	<del>GA-432B</del>	COOLING TOWER FAN <i>see EF.2</i>	5/67		CT308	14832	FLUOR	
20	29	NG-101	EMERGENCY GENERATOR	12/64	LUMMUS	4978	1218	ONAN DISTRIBUTING CO.	

*Electrical Sub station*

PLANT ASSETS REGISTER  
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UNIT	AREA	EQUIP NBR	DESCRIPTION	DATE TO PP&E	CONTRACTOR NBR	PO NBR	EQUIPMENT SUPPLIER	NOTES
*****TECHNICAL DEVELOPMENT								
20	30	<del>EA-900</del>	PILOT FURNACE	10/69	CT753			
20	30	<del>EA-901</del>	PILOT TICL4 VAPORIZER	10/69	CT753	5479	TOWERS, MYERS & CO.	
20	30	EA-902	DMW FURNACE JACKET COOLER-FORMERLY EA-2 CT 753	12/64	LUMMUS 4978	401	ALCOA PROD.	
20	30	<del>EA-903</del>	CO COMPRESSOR AFTER COOLER	10/69	CT753	5274	AIR POWER OF OHIO	
20	30	<del>EA-904</del>	O2 PREHEATER	10/69	CT753		CABOT	
20	30	EE-11	EJECTOR FROM SAND MILL PA456 <i>see</i>	9/71	CT798	6268	LESTER JOHNSON CO.	
20	30	FA-43A	SLURRY TREATMENT TANK	2/71	5705	1350	E & W SERVICES	
20	30	FA-483	SURGE TANK SLURRY	9/71	CT798	7804	COROFAC, INC.	
20	30	<del>FA-900</del>	TICL4 BLEND TANK	10/69	CT753			
0	30	<del>FA-901</del>	TICL4 DAY TANK	10/69	CT753			
20	30	<del>FA-902</del>	D.M.W. CAPACITY TANK	10/69	CT753			
20	30	<del>FA-903</del>	CO COMPRESSOR RECEIVER	10/69	CT753			
20	30	<del>FA-904</del>	TICL4 HOUR TANK	10/69	CT753			
20	30	<del>FA-905</del>	ALCL3 BATCH POT	10/69	CT753			
20	30	<del>FA-906</del>	OIL SURGE TANK	10/69	CT753			
20	30	<del>FA-907</del>	SLURRY COLLECTION TANK	10/69	CT753			
20	30	FA-911	ADDITION TANK	10/69	CT752			
20	30	FA-912	PH CONTROL TANK	10/69	CT752			
20	30	FA-915	BURNER PRODUCT SLURRY TANK	10/69	5502			
20	30	FG-471A	PORTABLE SAND STORAGE TANKS	9/71	CT798	7612	CONTINENTAL FREMONT	
20	30	FB-471B	PORTABLE SAND STORAGE TANKS	9/71	CT798	7612	CONTINENTAL FREMONT	
20	30	<del>FA-900</del>	TICL4 FILTER BETWEEN FA-902 & FA-903	10/69	CT753	5831	HUNTER LEMKE CO.	
20	30	<del>FA-901</del>	PILOT COLLECTION BIN	10/69	CT753	5824	E & W SERVICES	
20	30	<del>FG-900</del>	PILOT BAG FILTER	10/69	CT753	4461	PULVERIZING MACHINERY CO	
20	30	FG-902	K & S ROTARY FILTER	10/69	CT752		KOMLINE-SANDERSON	
20	30	GA-498	SLURRY PUMP TO FA41 FROM SANDMILL	9/71	CT798	6150	ALLEN PUMP CO.	
20	30	GA-901	H2O JACKET PMP-FORMERLY GA421 SEE CT753	9/67	CT219	14530	DURCO-TELCO INC.	
20	30	GA-905	CAUSTIC RECYCLE PUMP ON PILOT SCRUBBER		4601		DORR OLIVER	
20	30	GA-906	MILLED SLURRY PUMP	10/69	CT752		DORR OLIVER	
20	30	GA-907	SLURRY FEED PUMP	10/69	CT752		EASTERN	
0	30	GA-908	FILTER FEED PUMP	10/69	5502		EASTERN	
20	30	<del>GA-909</del>	CO COMPRESSOR	10/69	CT753	5274	AIR POWER OF OHIO	
20	30	GB-901	PILOT RECYCLE BLOWER FORMERLY GB-416	11/65	5500	11055	SUTORBITL CORP.	RETIRED
20	30	GD-473A	AGITATOR FOR PA-903-A SEE W.O. 5024	9/71	CT798	5743	PHILADELPHIA GEAR CORP.	
20	30	GD-487	AGITATOR FOR FA-43A WAS GD-911	10/71	05705	1266	LIGHTNIN MIXER	
20	30	GD-43H	DRAFT TUBE AGITATOR FOR FA-43A-WAS GD912	10/71	05705	1266	LIGHTNIN MIXER	
20	30	<del>GD-901</del>	AGITATOR FOR FA-902	10/69	CT753	5273	CHEMINEER, INC.	
20	30	GD-902	AGITATOR FOR FA-909	10/69	CT752		CHEMINEER, INC.	
20	30	GD-904	AGITATOR FOR FA-911 DRAFT TUBE	10/69	CT752		CHEMINEER, INC.	
20	30	GD-905	AGITATOR FOR FA-911	10/69	CT752		CHEMINEER, INC.	
20	30	GD-906	AGITATOR FOR FA-912 DRAFT TUBE	10/69	CT752		CHEMINEER, INC.	
20	30	GD-907	AGITATOR FOR FA-912	10/69	CT752		CHEMINEER, INC.	
20	30	GD-908A	AGITATOR FOR FA-913	10/69	CT752		CHEMINEER, INC.	
20	30	GD-908B	AGITATOR FOR FA-913	10/69	CT752		CHEMINEER, INC.	
20	30	GD-909A	AGITATOR FOR FA-914	10/69	CT752		CHEMINEER, INC.	
20	30	GD-909B	AGITATOR FOR FA-914	10/69	CT752		CHEMINEER, INC.	
20	30	PA-456A	SAND MILL	9/71	CT798	5872	E & W SERVICES	

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UNIT	AREA	EQUIP NBR	DESCRIPTION	DATE TO PP&E	CONTRACTOR NBR	PO NBR	EQUIPMENT SUPPLIER	NOTES
20	50	PA-901	PILOT PLANT SAND MILL	10/69	CT752			
20	50	<del>PS-900</del>	PILOT BURNER	10/69	CT753			

— = retired

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UNIT	AREA	EQUIP NBR	DESCRIPTION	DATE TO PPGE	CONTRACTOR NBR	PROJ NBR	PO NBR	EQUIPMENT SUPPLIER	NOTES
*****WASTE DISPOSAL & POLLUTION CONTROL									
20	32	BG-115	FLOCCULANT FEEDER TO PONDS	5/67		CT308	20630	BETZ LABORATORIES	
20	32	CR-400	TIO2 250 DISPOSAL STACK	6/69		CT643	2260	HEIL PROCESS EQUIPMENT C	
20	32	DA-437	SPRAY TOWER TIO2	4/73		05004	675	POLY CON	
20	32	DA-438	SCRUBBER TIO2	4/73	NJ2	05004	675	POLY CON	
20	32	DZ-101	AEROBIC DIGESTER -SEE PA 106	12/64	LUMMUS	4978	2530	AIR MAZE CORP.	
20	32	FA-15	LIME STORAGE TANK *OLD SULFUR MONO TANK	12/64	LUMMUS	4978	2518	BUFFALO TANK DIV.	
20	32	FA-413	CAUSTIC SODA TANK	8/65		CT166	9616	YOUNGSTOWN STEEL TANK	
20	32	FA-414	CAUSTIC SODA TANK	8/65		CT166	9616	YOUNGSTOWN STEEL TANK	
			SEE CT 682						
20	32	FA-504	TIO2 SCRUBBER SEAL TANK	4/73	NJ2	05004	6918		
0	32	GA-115	POLYFLOC TO PONDS	5/67		CT308		ZENITH	
20	32	GA-122	SANITARY SEWAGE PUMP	12/64	LUMMUS	4978	528	MOONEY	
20	32	GA-414	PUMP CAUSTIC SODA	8/65		CT166	9627	WORTHINGTON CORP.	
20	32	GA-460	CHEM. SUMP PUMP	10/66		CT475	33668	WILFLEY SCHEEL CO.	
20	32	GA-460S	CHEM. SUMP PUMP	10/66		CT475	33668	WILFLEY SCHEEL CO.	
20	32	GA-507	PUMPS @ OXIDE N. WEST SUMP	5/71		CT897	7607	GOULDS PUMP INC.	
20	32	GA-522	LAD SUMP PUMP	5/72		CT897	8516	FLOTEC INC.	
20	32	GA-523	METERG PUMP POLYFLOC 1110 EFFLUENT CNTR	8/72		CT897			
20	32	GB-445	AERATOR BLOWER FOR DZ-101	12/64	LUMMUS	4978	2530	AIR MAZE CORP.	
20	32	GC-429	SCRUBBER BLOWER *TIO2*	4/73		05004	675	BUFFALO FORGE	
20	32	HT-15	AGITATOR FOR FA15 LIME TK	4/75	NJ2	05026	89160	CLEVELAND MIXG & EQUIP.	
20	32	GI-115	POLYFLOC AGITATOR WITH BG115	5/67		CT308		LIGHTNING MIXER	
20	32	JJ-531	SCREW FEEDER FOR LINE SERVICE	2/75	NJ2	05026	9597	MEIR TRANSMISSION	
20	32	PA-106	DIGESTER-7000 GAL. CAP.	12/64	LUMMUS	4978	2530	AIR MAZE COMPANY	
20	32	PA-107	MILL DESUPERHEATER	12/64	LUMMUS	4978	2530	AIR MAZE COMPANY	
20	32	PA-470	TIO2 UNIT SCRUBBER VENTURI	4/73	NJ2	05004	6750	POLY-CON CORP.	
20	32	PA-473	TIO2 STORM SUMP	8/72		CT897		NJZ	
20	32	PA-474	TIO2 RET. BASIN	8/72		CT897		NJZ	
20	32	PA-531	SK FIG. 267 EDUCTOR 3IN.	2/75		05026	10200	SCHUTTE & KOERTING	
20	32	PA-532	ROTARY AIR LOCK	4/75	NJ2	05026	18410	RALSTON ENG.*ISOMATICS	

THE NEW JERSEY LING CO.  
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UNIT	AREA	EQUIP NBR	DESCRIPTION	DATE TO PP&E	CONTRACTOR	PROJ NBR	PO NBR	EQUIPMENT SUPPLIER	NOTES
*****PACKING									
20	40	EA-465	PACKER AIR PREHEATER					AMERICAN STANDARD	
20	40	FE-4A	PACKING BINS	12/64	LUMMUS	4978	312	HEMMINGER	
20	40	FE-4B	PACKING BINS	12/64	LUMMUS	4978	312	HEMMINGER	
20	40	FE-4C	PACKING BINS	12/64	LUMMUS	4978	312	HEMMINGER	
20	40	FE-4D	PACKING BINS	12/64	LUMMUS	4978	312	HEMMINGER	
20	40	FE-5A	BAGGING HOPPERS	12/64	LUMMUS	4978	312	HEMMINGER	
20	40	FE-5B	BAGGING HOPPERS	12/64	LUMMUS	4978	312	HEMMINGER	
20	40	FG-8	BAG FILTER PACKING AREA	12/64	LUMMUS	4978	318	PULVERIZING MACHINE CO.	
20	40	GB-16	BLOWER FOR FG-8	12/64	LUMMUS	4978	515	BUFFALO FORGE	
	40	GB-26X	AIR SLIDE CONVEYOR BLOWER	12/64	LUMMUS	4978	903	FULLER CO.	
	40	GB-441	AIRSLIDE CONVEYOR BLOWER FORMERLY GB-31AX	12/64	LUMMUS	4978	1624	WILLIAMS & CO.	
20	40	JD-410	BAG HANDLING CONVEYOR - SEE WD 7117	11/69		CT750	11966		
20	40	JD-417	AIRSLIDE TO FE-5A FROM FE-4D	7/65		CT266	13641	A. LOUIS STEEL	
20	40	JD-418	AIRSLIDE TO FE-5A FROM FE-4C	7/65		CT266	13641	A. LOUIS STEEL	
20	40	JD-419	AIRSLIDE TO FE-5B FROM FE-4B	7/65		CT266	13641	A. LOUIS STEEL	
20	40	JD-420	AIRSLIDE TO FE-5B FROM FE-4A	7/65		CT266	13641	A. LOUIS STEEL	
20	40	PA-5A	BAGGING MACHINES	12/64	LUMMUS	4978	1603	ST. REGIS	
20	40	PA-6B	BAGGING MACHINES	12/64	LUMMUS	4978	1603	ST. REGIS	
20	40	PA-23A	BAG CHECKWEIGH SCALES	12/64	LUMMUS	4978	1604	TOLEDO	
20	40	PA-23B	BAG CHECKWEIGH SCALES	12/64	LUMMUS	4978	1604	TOLEDO	
20	40	PA-25A	INTERNAL BIN ACTIVATOR FOR FE-4A	12/64	LUMMUS	4978	1615	VIBRA SCREW	
20	40	PA-25B	INTERNAL BIN ACTIVATOR FOR FE-4B	12/64	LUMMUS	4978	1615	VIBRA SCREW	
20	40	PA-25C	INTERNAL BIN ACTIVATOR FOR FE-4C	12/64	LUMMUS	4978	1615	VIBRA SCREW	
20	40	PA-25D	INTERNAL BIN ACTIVATOR FOR FE-4D	12/64	LUMMUS	4978	1615	VIBRA SCREW	
20	40	PA-86	ROTARY AIR VALVE FOR FG-8	12/64	LUMMUS	4978	1625	SPROUT WALDRON	

EQUIPMENT COUNT AREA 42 1

LIMITED WARRANTY DEED

KNOW ALL MEN BY THESE PRESENTS that Cabot Titania, Inc., a Delaware corporation, the Grantor (hereinafter called "CTI"), which claims title by deed recorded in Volume 666, page 86, of Ashtabula County Records, for and in consideration of TEN DOLLARS (\$10.00) and other valuable consideration received to its full satisfaction of The New Jersey Zinc Company, a division of Gulf & Western Industries, Inc., a Delaware corporation, the Grantee having a place of business and whose tax mailing address will be 2045 City Line Road, Bethlehem, Pennsylvania 18018 (hereinafter called "NJZ"), does GIVE, GRANT, BARGAIN, SELL AND CONVEY unto NJZ, its successors and assigns, all of the following premises with the buildings and improvements thereon erected, situate, lying and being in the Township of Ashtabula, County of Ashtabula and State of Ohio as described in Exhibit A, attached hereto and made a part hereof.

TOGETHER with all its right, title and interest to the easement granted by the General Tire and Rubber Company to Cabot Corporation dated August 17, 1962 and recorded in Volume 618, Page 433 of Ashtabula County Records, and the easement granted by The State Metal & Steel Company, Inc. to Cabot Corporation dated May 28, 1962 and recorded in Volume 615, Page 268 of Ashtabula County Records, the right of first refusal granted in the deed from National Distillers and Chemical Corporation to Cabot Titania Corporation dated January 4, 1963 and recorded in Volume 623, Page 56, Ashtabula County Records, and the easements granted by National Distillers and Chemical Corporation to Cabot Titania Corporation dated September 30, 1963 and recorded in Volume 631, Page 324 and Volume 631, Page 328 of said Records, all other appurtenant easements, rights of way, and appurtenances of record.

TO HAVE AND TO HOLD the above granted and regained premises with the appurtenances thereof unto NJZ, its successors and assigns forever.

CTI for itself and its successors and assigns does hereby covenant with NJZ, its successors and assigns, that the premises and the appurtenances thereto are free and clear of all liens and encumbrances created by or arising from, through or under the Grantor, except the easements for pipelines dated January 24, 1963 and March 27, 1963, to The Ashtabula Water Works Company and to Union Carbide Company dated May 14, 1963, recorded in Volume 623, Page 175, Volume 627, Page 174 and Volume 626, Page 211, respectively, of said Records, the deed of building and lease of land, Cabot Titania, <sup>CORPORATION</sup> ~~Inc.~~ Lessor to Cabot Corporation, Lessee, dated June 10, 1963, filed for record June 24, 1963 and recorded in Volume 62, page 95 of Ashtabula County Record of Leases, leasing a building located in the Holmes Tract, Ashtabula Township, for a term of twentyfive years, ending June 9, 1988; the easement for pipeline for transmission and distribution of water, Cabot Titania, Inc. a Delaware corporation to the Ashtabula Water Works Company dated October 26, 1967 filed for record December 29, 1967, and recorded in Volume 671, page 503, of Ashtabula County Record of Deeds, in, under, across and over lands in Erie Tract, Ashtabula Township; the easement for electrical transmission and distribution lines from Cabot Titania, Inc., a Delaware corporation, to the Cleveland Electric Illuminating Corporation, dated May 10, 1972, filed for record May 17, 1972 and recorded in Volume 709, page 519, Ashtabula County Record of Deeds, over, under, and across 2.33 acres in Lots 5 and 8 Erie Tract, Ashtabula Township; the easement to widen and improve Middle Road, from Cabot Titania, Inc., a Delaware Corporation, to Board of Township Trustees of Ashtabula Township, dated June 27, 1973, filed for record March 14, 1974 and recorded in Volume 775, page 242 of Ashtabula County Record of Deeds, granting an easement of an additional twenty feet to the North of the northerly line of Middle Road and containing 0.38± acres of land,

taxes and assessments, both general and special not due and payable on the date this deed is filed for record, zoning, resolutions and any restrictions, conditions, limitations, agreements, reservations, rights of way or easements of record; and that it will warrant and defend the title to the premises and the appurtenances thereto unto NJZ, its successors and assigns forever against all lawful claims and demands of all persons claiming by, from, through or under CTI, except as aforesaid. CTI does hereby assign, grant, remise and quitclaim unto NJZ, its successors and assigns, all rights, claims and causes of action which Grantor may now or hereafter have against any predecessors in title to the premises with respect to the premises or the appurtenances thereto by virtue of any covenants or warranties contained in any deeds in the chain of title to the premises or the appurtenances thereto.

IN WITNESS WHEREOF, Cabot Titania, Inc. the Grantor, hereunto sets its hand and corporate seal by its duly authorized officers this 28<sup>th</sup> day of May, 1975.

Signed and acknowledged  
the presence of:

CABOT TITANIA, INC.

Mary E. Ahern

By John A. Brown  
Vice President

ATTEST:

Arthur Dwyer

Walter J. Shockey  
Secretary

EXHIBIT A

Situated in the Township of Ashtabula, County of Ashtabula and State of Ohio, and known as being part of the Holmes Tract in said Ashtabula Township, and bounded and described as follows:

Commencing at a point in the center line of Middle Road, said point being 766.38 feet east of the center line of State Road as measured along said center line of said Middle Road; thence running North 0° 35' 30" East a distance of 70.01 feet to a point, which point is the principal place of beginning; thence North 0° 35' 30" East a distance of 793.06 feet to an iron pipe in the south line of land conveyed to Detrex Corporation by deed dated March 15, 1949 and recorded in Volume 409, Page 548 of Ashtabula County Records of Deeds; thence South 87° 23' 30" East and along the south line of land so conveyed to Detrex Corporation as aforesaid; a distance of 767.01 feet to a point, which point is 30.04 feet westerly from an iron pin at the northwest corner of an 80-foot strip of land conveyed to The New York Central Railroad Company as Parcel Two in a deed dated June 14, 1929 and recorded in Volume 305, Page 304 of Ashtabula County Records of Deeds; thence South 0° 17' 30" East and parallel with the westerly line of said land of The New York Central Railroad Company, a distance of 397.35 feet to a point; thence South 11° 40' 45" West a distance of 361.47 feet to a point; thence South 89° 27' West parallel with the center line of Middle Road and 70 feet northerly therefrom, a distance of 703.29 feet to the principal place of beginning and containing 13.379 acres of land according to the Candela Survey, dated September 1961.

Situated in the Township of Ashtabula, County of Ashtabula and State of Ohio, and known as being part of Lots 7 and 8, in the Erie Tract and part of the Holmes Tract, and bounded and described as follows:

Beginning in the center line of Middle Road, aka Markham Road, 40 feet wide, at an iron bolt at the North-westerly corner of said Lot No. 8; thence North 88° 16' 45" East along said center line, 454.46 feet to a point distant 165 feet Southwesterly by rectangular measurement from the survey base line of The Cleveland Electric Illuminating Company's right of way as now staked and located; thence South 18° 20' 30" East on a line parallel with and distant 165 feet Southwesterly by rectangular measurement from said base line, 20.87 feet to an iron pipe in the Southerly line of Middle Road; thence continuing South 18° 20' 30" East along said parallel line 187.80 feet to an iron pipe at an angle; thence South 0° 03' 30" West on a line parallel with and distant 165 feet Westerly by rectangular measurement from said base line 326.00 feet to an iron pipe in the Northwesterly right of way line of The New York Central Railroad Company, formerly The Lake Shore and Michigan Southern Railroad Company; thence following said right of way line the following courses and distances:

South 69° 16' West, 107.88 feet to an iron pipe,  
 South 0° 12' 30" West, 10.70 feet to an iron pipe,  
 South 69° 16' West, 933.68 feet to an iron pipe,  
 North 20° 44' West, 5.00 feet to an iron pipe,  
 South 69° 16' West, 714.57 feet to an iron pipe,  
 South 0° 23' East, 5.33 feet to an iron pipe,  
 South 69° 16' West, 251.77 feet to a concrete  
 monument;

thence Northeasterly along the Southeasterly line of a 70 foot railroad right of way conveyed to The New York Central Railroad Company by deed dated May 24, 1929, and recorded in Volume 305, Page 305 of Ashtabula County Records on a curve deflecting to the left, an arc distance of 617.9 feet to an iron pin, said curve having a radius of 758.28 feet + and a chord which bears North 22° 57' 40" East, 595.73 feet; thence North 0° 23' West continuing along the Easterly line of land so conveyed 640.36 feet to a concrete monument in the Southerly line of Middle Road; thence continuing North 0° 23' West 20 feet to the center line of Middle Road; thence North 89° 34' East along said center line 5.07 feet to an iron pin at an angle therein; thence North 88° 47' 45" East continuing along said center line 1127.23 feet to the place of beginning, and containing 0.683 acres of land in the Holmes Tract, 23.381 Acres of land in Lot No. 7 and 7.293 Acres of land in Lot No. 8, for a total of 31.357 Acres of land, according to the Survey by Jos. Candela, registered surveyor, dated June 1961, be the same more or less, but subject to all legal highways.

Situated in the Township of Ashtabula, County of Ashtabula and State of Ohio, and known as being part of Lots Nos. 5 and 6 in the Erie Tract, and bounded and described as follows:

Beginning in the center line of Middle Road, aka Markham Road, 40 feet wide at an iron bolt at the Southwesterly corner of said Lot No. 5; thence North 88° 16' 45" East along said center line 454.46 feet to a point distant 165 feet Southwesterly by rectangular measurement from the survey base line of The Cleveland Electric Illuminating Company's right of way as now staked and located; thence North 18° 20' 30" West on a line parallel with and distant 165 feet Southwesterly by rectangular measurement from said base line 20.87 feet to an iron pipe in the Northerly line of Middle Road; thence continuing North 18° 20' 30" West along said parallel line 1092.47 feet to an iron pipe in the Easterly line of land conveyed to Ernest Johnson and Judith Johnson by deed dated August 7, 1931 and recorded in Volume 315, Page 474 of Ashtabula County Records; thence continuing North 18° 20' 30" West along said parallelline 35.10 feet to an iron pin in the Northerly line of land so conveyed; thence South 88° 00' West along the Northerly line of land so conveyed 95.80 feet to an iron pin in an Easterly line of land conveyed to The General Tire and Rubber Company by deed dated August 31, 1953 and recorded in Volume 499, Page 518 of Ashtabula County Records; thence South 0° 09' East along said Easterly line being the Westerly line of said Lot No. 5, 142.5 feet to a concrete monument at a Southeasterly corner of land so conveyed; thence South 87° 21' West along a Southerly line of land so conveyed 354.5 feet to a concrete monument at an inner corner of land so conveyed; thence South 0° 22' 45" West along an Easterly line of

land so conveyed to The General Tire and Rubber Company 883.63 feet to an iron pin; thence North  $89^{\circ} 37' 15''$  West continuing along the line of land so conveyed 16.5 feet to an iron pin; thence South  $0^{\circ} 22' 40''$  West along the line of land so conveyed 46 feet to a concrete monument in the Northerly line of Middle Road; thence continuing South  $0^{\circ} 22' 40''$  West along the line of land so conveyed 20 feet to the center line of Middle Road and the Southeasterly corner or land so conveyed; thence North  $88^{\circ} 47' 45''$  East, along said center line, 379.5 feet to the place of beginning, and containing 7.872 Acres of land in Lot No. 6 and 6.950 Acres of land in Lot No. 5, for a total of 14.822 Acres of land, according to the survey by Jos. Candela, registered surveyor, dated June, 1961, be the same more or less, but subject to all legal highways.

Situated in the Township of Ashtabula, County of Ashtabula and State of Ohio, and known as being part of the Holmes Tract in said Ashtabula Township, and bounded and described as follows:

Beginning at a point in the centerline of State Road (60 feet wide), said point being 115 feet Northerly from the intersection of the centerline of Middle Road (40 feet wide), measured along the centerline of State Road; thence North  $0^{\circ} 39'$  West along the centerline of State Road, 492.47 feet to an iron pin monument at the point of deflection in State Road; thence North  $0^{\circ} 03'$  West along the centerline of State Road, 298.60 feet to the Southwest corner of land conveyed to Detrex Chemical Industries, Inc. by deed recorded in Volume 409, Page 548, Ashtabula County Record of Deeds; thence South  $87^{\circ} 23' 30''$  East along the Southerly line of said Detrex Corporation land, 30.03 feet to an iron pipe in the Easterly line of State Road; thence continuing in the same course, 753.21 feet to an iron pipe in the Northwest corner or land conveyed to the Cabot Corporation by deed recorded in Volume 611, Page 228, Ashtabula County Records of Deeds; thence South  $0^{\circ} 35' 30''$  West along the Westerly line of said land of Cabot Corporation, 793.06 feet to an iron pipe; thence South  $89^{\circ} 27'$  West, parallel to the centerline of Middle Road and 70 feet Northerly therefrom, 697.77 feet to an iron pipe; thence North  $0^{\circ} 39'$  West, parallel to the centerline of State Road and 70 feet Easterly therefrom, 45 feet to an iron pipe; thence South  $89^{\circ} 27'$  West, parallel to the centerline of Middle Road, and 115 feet Northerly therefrom, 40 feet to an iron pipe in the Easterly line of State Road; thence continuing in the same course 30 feet to the place of beginning and containing 14.45 acres of land.

COMMONWEALTH OF MASSACHUSETTS  
COUNTY OF SUFFOLK

SS.

C 11. 10M-8-74-104148

The Commonwealth of Massachusetts

PAUL H. GUZZI

Secretary of the Commonwealth

y personally

D

1682

Boston, May 28, 1975

I hereby certify,

That at the date of the attestation hereto annexed

*John G. Whitman*

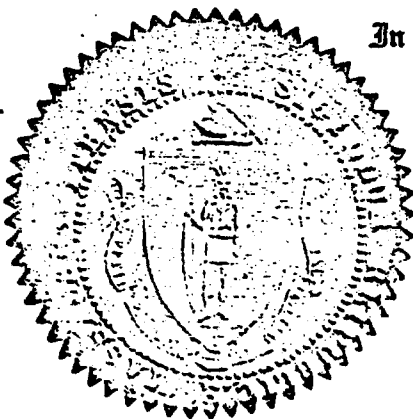
ed that they  
the free  
deed of them

whose name is signed to the attached certificate of acknowledgment, proof or affidavit, was at the time of taking such acknowledgment, proof or affidavit, a NOTARY PUBLIC for the said Commonwealth duly commissioned and sworn; that to *his* acts and attestations as such, full faith and credit are and ought to be given in and out of court; that as such Notary Public *was* was by law authorized to take the same, to take depositions, to administer oaths and take acknowledgments of deeds or conveyances of lands, tenements or hereditaments and other instruments throughout the Commonwealth to be recorded according to law; that I have compared *his* signature to the annexed attestation with the original on file in this office, and verily believe it to be genuine. I further certify that the impressions of the seals of Notaries Public are not required by law to be filed in this office.

and of-  
y, 1975.

*John G. Whitman*  
JG. WHITMAN

1 November 19, 1976



In testimony of which, I have hereto affixed the

Great Seal of the Commonwealth

the date above written.

*Paul Guzzi*

PAUL H. GUZZI

Secretary of the Commonwealth

COMMONWEALTH OF MASSACHUSETTS

COUNTY OF SUFFOLK

ss.

BEFORE ME, a Notary Public in and for said County personally appeared the above-named CABOT TITANIA, INC. by

John Andrews, its President and

Walter F. Friel, its Secretary, who acknowledged that they did sign the foregoing instrument and that the same is the free act and deed of said Corporation, and the free act and deed of them personally and as such officers.

IN TESTIMONY WHEREOF, I have hereunto set my hand and official seal at Boston, Massachusetts, this 14<sup>th</sup> day of May, 1975.

John G. Wenthham  
Notary Public  
JOHN G. WENTHAM

My commission expires on November 19, 1976

LIMITED WARRANTY DEED

KNOW ALL MEN BY THESE PRESENTS that Cabot Corporation, a Delaware corporation, the Grantor (hereinafter called "CABOT"), which claims title by deed recorded in Volume 627, Page 205, Ashtabula County Record of Deeds, for and in consideration of TEN DOLLARS (\$10.00) and other valuable consideration received to its full satisfaction of The New Jersey Zinc Company, a division of Gulf & Western Industries, Inc., a Delaware corporation, the Grantee having a place of business whose tax mailing address will be 2045 City Line Road, Bethlehem, Pennsylvania 18018 (hereinafter called "NJZ") does GIVE, GRANT, BARGAIN, SELL AND CONVEY unto NJZ, its successors and assigns, the following described premises:

Situated in the Township of Austinburg, County of Ashtabula and State of Ohio, and known as being a part of Lot No. 14 in said Austinburg Township, and bounded and described as follows:

Beginning at a point at the intersection of the easterly line of land conveyed to Norman and Agnes Beebe by deed recorded in Volume 609 at page 235 of Ashtabula County Deed Records, with the center line of Clay Street (50 feet wide):

Course 1: Thence South 89 degrees 38'46" East along the center line of Clay Street, 562.13 feet to an angle in said center line and known as Station 202 + 54.6 according to Road Alignment Record 16 E-F on file at the office of the Ashtabula County Engineer;

Course 2: Thence North 89 degrees 46'16" East along the center line of Clay Street, 768.70 feet to a point in the Northwestern corner of land conveyed to Frank Turek by deed recorded in Volume 564 at Page 172 of Ashtabula County Deed Records;

Course 3: Thence South 0 degrees 21'14" West along the westerly line of land so conveyed to Turek (passing through an iron pipe found at 25.33 feet) 1048.86 feet to an iron pipe set in the northerly right of way line of State Route No. 1;

Course 4: Thence South 53 degrees 59'21" West along said north right of way line of State Route No. 1, 424.16 feet to an iron pipe set;

Course 5: Thence South 50 degrees 21'36" West along said northerly right of way line of State Route No. 1, 241.93 feet to an iron pipe set;

Course 6: Thence South 57 degrees 12'21" West along said northerly right of way line of State Route No. 1, 536.43 feet to an iron pipe set;

Course 7: Thence South 59 degrees 33'31" West along said northerly right of way line of State Route No. 1, 438.79 feet to an iron pipe set in the easterly line of land so conveyed to said Beebes, said easterly line being also the easterly line of Lot No. 13, and the westerly line of Lot No. 14, in said Township;

Course 8: Thence North 1 degree 00'00" East along said easterly line of land so conveyed to said Beebes, and said common line between Lots No. 13 and 14 in said Township (passing through an iron pin found at 1941.12 feet), 1966.12 feet to the place of beginning.

Containing 47.030 acres of land according to a survey by Debevec and Salo, civil engineers.

TO HAVE AND TO HOLD the above granted and bargained premises with the appurtenances thereof unto NJZ, its successors and assigns forever.

Cabot for itself and its successors and assigns does hereby covenant with NJZ, its successors and assigns, that the premises and the appurtenances thereto are free and clear of all liens and encumbrances created by or arising from, through or under the Grantor except the easements dated December 12, 1927 and August 13, 1929, to The Cleveland Electric Illuminating Company, recorded in Volume 293, Page 325, and Volume 309, Pages 538 and 539, respectively of said Records, boundary line agreement dated April 24, 1954 as to Lot 14 Austinburg Township recorded in Volume 506 page 475 of said Records and appropriation of direct access to Ohio Route One (1) (Interstate 90) Highway Appropriation

Case No. 45847 Ashtabula County Common Pleas Court, taxes and assessments, both general and special, not due and payable on the date this deed is filed for record, zoning, resolutions and any restrictions, conditions, limitations, agreements, reservations, rights of way or easements of record; and that it will warrant and defend the title to the premises and the appurtenances thereto unto NJZ, its successors and assigns forever against all lawful claims and demands of all persons claiming by, from, through or under Cabot, except as aforesaid. Cabot does hereby assign, grant, remise and quitclaim unto NJZ, its successors and assigns, all rights, claims and causes of action which Grantor may now or hereafter have against any predecessors in title to the premises with respect to the premises or the appurtenances thereto by virtue of any covenants or warranties contained in any deed in the chain of title to the premises or the appurtenances thereto.

IN WITNESS WHEREOF, Cabot Corporation  
the Grantor, hereunto sets its hand and corporate seal by its duly  
authorized officers this 27 day of May 1975.

Signed and acknowledged in  
the presence of:

CABOT CORPORATION

Barbara Germain

By Robert A. Chayer  
President

ATTEST

Althes Burpo

Walter T. Buckley  
Secretary

COMMONWEALTH OF MASSACHUSETTS )

COUNTY OF SUFFOLK )

BEFORE ME, a Notary Public in and for said County personally  
appeared the above-named CABOT CORPORATION, by

Robert A. Changier, its President and

Walter F. Buckley, its Secretary, who acknowledged that  
they did sign the foregoing instrument and that the same is the  
free act and deed of said Corporation, and the free act and deed  
of each of them personally and as such officers.

IN TESTIMONY WHEREOF, I have hereunto set my hand and of-  
ficial seal at Boston, Massachusetts, this 8<sup>th</sup> day of May, 1975.

John G. V. [Signature]  
JOHN G. V. [Signature] Notary Public  
My commission expires on November 19, 1976

Note #1

PROMISSORY NOTE

\$460,000

Boston, Massachusetts

June 1, 1975

For value received, the undersigned, The New Jersey Zinc Company, a division of Gulf and Western Industries, Inc., a Delaware corporation, promises to pay in immediately available funds to the order of Cabot Titania, Inc., at its office located at 125 High Street, Boston, Massachusetts 02110, the principal sum of Four Hundred Sixty Thousand Dollars (\$460,000) in lawful money of the United States of America on June 1, 1976, with interest at the prime rate as fixed by The First National Bank of Boston on the maturity date payable in arrears plus two percent (2%). The principal sum and interest on maturity shall be due only in an amount not exceeding fifty percent (50%) of the amount by which net profits after taxes for the fiscal year ending July 31, 1976 from operation of the property leased on June 1, 1972, by Cabot Corporation and Cabot Titania, Inc., Lessors and The New Jersey Zinc Company, Lessee, exceeds (a) Two Million Dollars (\$2,000,000) plus (b) One Million Dollars (\$1,000,000) for each ten percent (10%) expansion of the  $TiO_2$  capacity of the leased property above 25,000 tons per year, adjusted to an amount which bears the same relation to the sum (a) and (b) above, as the average of the monthly wholesale price index figures for "all commodities" as published in "Wholesale Prices and Price Indexes", a publication of the United States Bureau of Labor and Statistics, for the fiscal year for which the computation is being made bears to the average of such index figure for the twelve (12) month period ending July 31, 1972. Principal and interest determined to be due on maturity shall be payable as soon after maturity as net profits after taxes for the fiscal year ending July 31, 1976 have been determined by an independent certified public accountant approved by CABOT TITANIA, INC. and CABOT CORPORATION. To the extent that net profits after taxes for the fiscal year ending July 31, 1976, are insufficient to pay principal and interest, any amounts remaining unpaid on July 31, 1976 shall be cancelled. All payments shall be made to Cabot Titania, Inc. at its office, 125 High Street, Boston, Massachusetts. Interest shall be calculated on the basis of actual days elapsed and a year of 365 or 366 days, as the case may be.

The undersigned may, at its option, pay all or any part of the principal before maturity, without penalty or premium.

IN WITNESS WHEREOF, The New Jersey Zinc Company, a division of Gulf and Western Industries, Inc., has caused this Note to be signed in its name by its Vice President, Finance thereunto duly authorized.

Signed in the presence of

THE NEW JERSEY ZINC COMPANY  
A Division of Gulf + Western  
Industries, Inc.

By: *H M Sartin*  
Vice President, Finance

Note #2

PROMISSORY NOTE

\$460,000

Boston, Massachusetts

June 1, 1975

For value received, the undersigned, The New Jersey Zinc Company, a division of Gulf and Western Industries, Inc., a Delaware corporation, promises to pay in immediately available funds to the order of Cabot Titania, Inc., at its office located at 125 High Street, Boston, Massachusetts 02110, the principal sum of Four Hundred Sixty Thousand Dollars (\$460,000) in lawful money of the United States of America on June 1, 1977, with interest at the prime rate as fixed by The First National Bank of Boston on the maturity date payable in arrears plus two percent (2%). The principal sum and interest on maturity shall be due only in an amount not exceeding fifty percent (50%) of the amount by which net profits after taxes for the fiscal year ending July 31, 1977 from operation of the property leased on June 1, 1972, by Cabot Corporation and Cabot Titania, Inc., Lessors and The New Jersey Zinc Company, Lessee, exceeds (a) Two Million Dollars (\$2,000,000) plus (b) One Million Dollars (\$1,000,000) for each ten percent (10%) expansion of the  $TiO_2$  capacity of the leased property above 25,000 tons per year, adjusted to an amount which bears the same relation to the sum (a) and (b) above, as the average of the monthly wholesale price index figures for "all commodities" as published in "Wholesale Prices and Price Indexes", a publication of the United States Bureau of Labor and Statistics, for the fiscal year for which the computation is being made bears to the average of such index figure for the twelve (12) month period ending July 31, 1972. Principal and interest determined to be due on maturity shall be payable as soon after maturity as net profits after taxes for the fiscal year ending July 31, 1977 have been determined by an independent certified public accountant approved by CABOT TITANIA, INC. and CABOT CORPORATION. To the extent that net profits after taxes for the fiscal year ending July 31, 1977, are insufficient to pay principal and interest, any amounts remaining unpaid on July 31, 1977 shall be cancelled. All payments shall be made to Cabot Titania, Inc. at its office, 125 High Street, Boston, Massachusetts. Interest shall be calculated on the basis of actual days elapsed and a year of 365 or 366 days, as the case may be.

The undersigned may, at its option, pay all or any part of the principal before maturity, without penalty or premium.

IN WITNESS WHEREOF, The New Jersey Zinc Company, a division of Gulf and Western Industries, Inc., has caused this Note to be signed in its name by its Vice President, Finance thereunto duly authorized.

Signed in the presence of

THE NEW JERSEY ZINC COMPANY  
A Division of Gulf + Western  
Industries, Inc.

By: *H M Sartin*  
Vice President, Finance

Note #3

PROMISSORY NOTE

\$460,000

Boston, Massachusetts

June 1, 1975

For value received, the undersigned, The New Jersey Zinc Company, a division of Gulf and Western Industries, Inc., a Delaware corporation, promises to pay in immediately available funds to the order of Cabot Titania, Inc., at its office located at 125 High Street, Boston, Massachusetts 02110, the principal sum of Four Hundred Sixty Thousand Dollars (\$460,000) in lawful money of the United States of America on June 1, 1978, with interest at the prime rate as fixed by The First National Bank of Boston on the maturity date payable in arrears plus two percent (2%). The principal sum and interest on maturity shall be due only in an amount not exceeding fifty percent (50%) of the amount by which net profits after taxes for the fiscal year ending July 31, 1978 from operation of the property leased on June 1, 1972, by Cabot Corporation and Cabot Titania, Inc., Lessors and The New Jersey Zinc Company, Lessee, exceeds (a) Two Million Dollars (\$2,000,000) plus (b) One Million Dollars (\$1,000,000) for each ten percent (10%) expansion of the  $TiO_2$  capacity of the leased property above 25,000 tons per year, adjusted to an amount which bears the same relation to the sum (a) and (b) above, as the average of the monthly wholesale price index figures for "all commodities" as published in "Wholesale Prices and Price Indexes", a publication of the United States Bureau of Labor and Statistics, for the fiscal year for which the computation is being made bears to the average of such index figure for the twelve (12) month period ending July 31, 1972. Principal and interest determined to be due on maturity shall be payable as soon after maturity as net profits after taxes for the fiscal year ending July 31, 1978 have been determined by an independent certified public accountant approved by CABOT TITANIA, INC. and CABOT CORPORATION. To the extent that net profits after taxes for the fiscal year ending July 31, 1978, are insufficient to pay principal and interest, any amounts remaining unpaid on July 31, 1978 shall be cancelled. All payments shall be made to Cabot Titania, Inc. at its office, 125 High Street, Boston, Massachusetts. Interest shall be calculated on the basis of actual days elapsed and a year of 365 or 366 days, as the case may be.

The undersigned may, at its option, pay all or any part of the principal before maturity, without penalty or premium.

IN WITNESS WHEREOF, The New Jersey Zinc Company, a division of Gulf and Western Industries, Inc., has caused this Note to be signed in its name by its Vice President, Finance thereunto duly authorized.

Signed in the presence of

THE NEW JERSEY ZINC COMPANY  
A Division of Gulf + Western  
Industries, Inc.

By: \_\_\_\_\_

*H M Sartin*

Vice President, Finance

Note #4

PROMISSORY NOTE

\$460,000

Boston, Massachusetts

June 1, 1975

For value received, the undersigned, The New Jersey Zinc Company, a division of Gulf and Western Industries, Inc., a Delaware corporation, promises to pay in immediately available funds to the order of Cabot Titania, Inc., at its office located at 125 High Street, Boston, Massachusetts 02110, the principal sum of Four Hundred Sixty Thousand Dollars (\$460,000) in lawful money of the United States of America on June 1, 1979, with interest at the prime rate as fixed by The First National Bank of Boston on the maturity date payable in arrears plus two percent (2%). The principal sum and interest on maturity shall be due only in an amount not exceeding fifty percent (50%) of the amount by which net profits after taxes for the fiscal year ending July 31, 1979 from operation of the property leased on June 1, 1972, by Cabot Corporation and Cabot Titania, Inc., Lessors and The New Jersey Zinc Company, Lessee, exceeds (a) Two Million Dollars (\$2,000,000) plus (b) One Million Dollars (\$1,000,000) for each ten percent (10%) expansion of the  $TiO_2$  capacity of the leased property above 25,000 tons per year, adjusted to an amount which bears the same relation to the sum (a) and (b) above, as the average of the monthly wholesale price index figures for "all commodities" as published in "Wholesale Prices and Price Indexes", a publication of the United States Bureau of Labor and Statistics, for the fiscal year for which the computation is being made bears to the average of such index figure for the twelve (12) month period ending July 31, 1972. Principal and interest determined to be due on maturity shall be payable as soon after maturity as net profits after taxes for the fiscal year ending July 31, 1979 have been determined by an independent certified public accountant approved by CABOT TITANIA, INC. and CABOT CORPORATION. To the extent that net profits after taxes for the fiscal year ending July 31, 1979, are insufficient to pay principal and interest, any amounts remaining unpaid on July 31, 1979 shall be cancelled. All payments shall be made to Cabot Titania, Inc. at its office, 125 High Street, Boston, Massachusetts. Interest shall be calculated on the basis of actual days elapsed and a year of 365 or 366 days, as the case may be.

The undersigned may, at its option, pay all or any part of the principal before maturity, without penalty or premium.

IN WITNESS WHEREOF, The New Jersey Zinc Company, a division of Gulf and Western Industries, Inc., has caused this Note to be signed in its name by its Vice President, Finance thereunto duly authorized.

Signed in the presence of

THE NEW JERSEY ZINC COMPANY  
A Division of Gulf + Western  
Industries, Inc.

By: \_\_\_\_\_

*H W Sartin*

Vice President, Finance

Note #5

PROMISSORY NOTE

\$460,000

Boston, Massachusetts

June 1, 1975

For value received, the undersigned, The New Jersey Zinc Company, a division of Gulf and Western Industries, Inc., a Delaware corporation, promises to pay in immediately available funds to the order of Cabot Titania, Inc., at its office located at 125 High Street, Boston, Massachusetts 02110, the principal sum of Four Hundred Sixty Thousand Dollars (\$460,000) in lawful money of the United States of America on June 1, 1980, with interest at the prime rate as fixed by The First National Bank of Boston on the maturity date payable in arrears plus two percent (2%). The principal sum and interest on maturity shall be due only in an amount not exceeding fifty percent (50%) of the amount by which net profits after taxes for the fiscal year ending July 31, 1980 from operation of the property leased on June 1, 1972, by Cabot Corporation and Cabot Titania, Inc., Lessors and The New Jersey Zinc Company, Lessee, exceeds (a) Two Million Dollars (\$2,000,000) plus (b) One Million Dollars (\$1,000,000) for each ten percent (10%) expansion of the  $TiO_2$  capacity of the leased property above 25,000 tons per year, adjusted to an amount which bears the same relation to the sum (a) and (b) above, as the average of the monthly wholesale price index figures for "all commodities" as published in "Wholesale Prices and Price Indexes", a publication of the United States Bureau of Labor and Statistics, for the fiscal year for which the computation is being made bears to the average of such index figure for the twelve (12) month period ending July 31, 1972. Principal and interest determined to be due on maturity shall be payable as soon after maturity as net profits after taxes for the fiscal year ending July 31, 1980 have been determined by an independent certified public accountant approved by CABOT TITANIA, INC. and CABOT CORPORATION. To the extent that net profits after taxes for the fiscal year ending July 31, 1980, are insufficient to pay principal and interest, any amounts remaining unpaid on July 31, 1980 shall be cancelled. All payments shall be made to Cabot Titania, Inc. at its office, 125 High Street, Boston, Massachusetts. Interest shall be calculated on the basis of actual days elapsed and a year of 365 or 366 days, as the case may be.

The undersigned may, at its option, pay all or any part of the principal before maturity, without penalty or premium.

IN WITNESS WHEREOF, The New Jersey Zinc Company, a division of Gulf and Western Industries, Inc., has caused this Note to be signed in its name by its Vice President, Finance thereunto duly authorized.

Signed in the presence of

THE NEW JERSEY ZINC COMPANY  
A Division of Gulf + Western  
Industries, Inc.

By: \_\_\_\_\_

*H M Sartin*

Vice President, Finance

Exhibit D

BILL OF SALE AND ASSIGNMENT

KNOW ALL MEN BY THESE PRESENTS, that GULF & WESTERN INDUSTRIES, INC., a Delaware corporation (hereinafter called "Seller"), for good and valuable consideration, the receipt and sufficiency whereof are hereby acknowledged, has granted, bargained, sold, assigned, conveyed, transferred, set over, confirmed and delivered, and by these presents does hereby grant, bargain, sell assign, convey, transfer, set over, confirm and deliver unto JERSEY TITANIUM COMPANY, a Delaware corporation (hereinafter called "Buyer"), its successors and assigns:

All of Seller's right, title and interest in and to the businesses, assets and properties of the following:

All of that property, consisting of approximately 189 acres of land in Ashtabula County, State of Ohio, more fully described in Schedule A attached hereto and made a part hereof, together with all buildings and improvements located thereon.

including, without limitation, all property, real, personal and mixed, tangible and intangible and wheresoever situated, cash on hand and in bank, accounts receivable, bills and notes receivable, merchandise, land, buildings, claims, demands, contracts, agreements, franchises, choses in action, securities, insurance policies, licenses, patents, copyrights, trademarks, trade names and registrations and applications therefor, as well as the goodwill associated therewith;

SUBJECT, HOWEVER, to all of Seller's obligations, indebtedness and liabilities relating to the business, assets and properties being transferred hereunder;

TO HAVE AND TO HOLD all said assets, properties and businesses hereby granted, bargained, sold, assigned, conveyed, transferred, set over and confirmed unto Buyer, its successors and assigns, for its and their own use, benefit and behoof forever.

For consideration aforesaid, Seller hereby constitutes and appoints Buyer, its successors and assigns, the true and lawful attorney and attorneys of Seller, with full power of substitution, for Seller and in its name and stead or otherwise, by or on behalf and for the benefit of Buyer, its successors and assigns, to demand and receive from time to time any and all of the assets and properties hereby granted, bargained, sold, conveyed, transferred, set over and confirmed and to give receipts and releases for, and in respect of, the same and any part thereof and to do all such acts and things in relation thereto, as Buyer, its successors and assigns, shall deem desirable.

Seller agrees, for itself and its successors and assigns, to do, execute and deliver or cause to be done, executed and delivered all such further acts, transfers, assignments and conveyances, for the better assuring, conveying and confirming unto Buyer, its successors and assigns, the assets, properties and businesses hereby assigned, transferred and conveyed as Buyer, its successors and assigns, shall reasonably require.

This instrument shall not constitute an assignment or agreement to assign any contract, lease, sales order or purchase order or any claim or right or any benefit arising thereunder or resulting therefrom if an attempted assignment thereof, without the consent of another party thereto, would constitute a breach thereof or in any way affect the rights of Buyer or Seller thereunder, unless and until such consent or approval shall have been obtained.

IN WITNESS WHEREOF, Seller has caused these presents to be signed in its corporate name by a Vice President, thereunto duly authorized, and its corporate seal to be hereunto affixed and attested by its Assistant Secretary at North Bergen, New Jersey, this 31st day of January, 1979.

  
Robert L. Jones  
Vice President

ATTEST:

  
Norman R. Forson  
Assistant Secretary

## SITE DESCRIPTION

15

The subject company owns a total of 189.09 acres in Ashtabula County separated into five parcels. Four of these parcels are clustered together in the vicinity of State Road and Middle Road in Ashtabula Township. The fifth parcel, used as a test site for paint pigment, is located approximately 10 miles to the southwest in Austinburg Township. a brief description of the parcels follows:

- (1) - A 31.36 acre parcel located on the south side of Middle Road. This irregularly shaped parcel has 1,510' of frontage on Middle Road. The topography is somewhat irregular with some swampy areas that would require the use of pilings for future construction. The southern perimeter of the property borders the Penn Central right-of-way. There is a 60' easement on the east side of the property for Cleveland Electric Illuminating Company.
- (2) - A 14.82 acre site directly accross Middle Road from parcel #1. This irregularly shaped site has 800' frontage along the north side of Middle Road. The topography is similar to Parcel #1 and the 60' Cleveland Electric Illuminating Company easement extend along the eastern perimeter of the site.
- (3) - This 27.83 site is located just west of Parcels #1 and #2 but is not contiguous with either one. The roughly rectangular site has 1,560' of frontage on Middle Road and 800' of frontage on State Road. The topography is generally level and swampy in some areas indicating the need for pilings in the event of future construction. There is a railroad siding along the east side of the site.

## SITE DESCRIPTION

12

(4) - This 68.05 acre site is located just northwest of Parcel #3 on the west side of State Road. The topography is gently rolling and the site is moderately wooded. There is 1,600' of frontage along State Road.

OWNED  
BY  
NJ2

(5) - The "Test Site" located on Clay Street in Austinburg Township is an irregularly shaped parcel containing 47.03 acres. The site has a gently rolling topography. There is 1,560' of frontage on Clay Street and 1,610' of frontage along Interstate Route 90. Since I-90 is a limited access highway there is no access from the site.



SCM closing

RECEIVED  
SEP 18 1984

August 14, 1984

R. P. MARSHALL

Ohio Environmental Protection Agency  
P. O. Box 1049  
361 East Broad Street  
Columbus, OH 43216

RE: NPDES Permit #3IE00017\*CD

Gentlemen:

On October 31, 1983, all assets and related liabilities of G&W Natural Resources Group - Titanium Division comprising its Ashtabula, Ohio titanium dioxide and titanium tetrachloride production facilities were acquired by SCM Chemicals. Included therein was the above-referenced OEPA NPDES Permit.

Please be advised that:

1. The date for transfer of permit responsibility and coverage is October 31, 1983.
2. G&W Natural Resources Group acknowledges that it is responsible for permit violations through the said transfer date, and SCM Chemicals acknowledges that it is responsible for permit violations thereafter.

It is requested that you accept this joint letter of G&W Natural Resources Group and SCM Corporation in fulfillment of transfer requirements and approve the said transfer.

Please address any questions or other correspondence to:

Stuart G. Breslow, Esq.  
SCM Chemicals  
3901 Glidden Road,  
Baltimore, Maryland 21226

Yours very truly,

SCM CHECMICALS  
Division of SCM Corporation

G&W NATURAL RESOURCES GROUP  
Division of Gulf & Western  
Industries, Inc.

By Robert A. Evans  
Robert A. Evans  
Vice President -  
Production and Research  
SCM Pigments

By Robert P. Marshall  
Robert P. Marshall  
Vice President

**Exhibit F**

THE NEW JERSEY ZINC COMPANY

ASHTABULA CHLORIDE TITANIUM DIOXIDE PLANT

## NEW JERSEY ZINC-ASHTABULA CHLORIDE TITANIUM DIOXIDE PLANT

### Page No.

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Raw Material Analyses or Specifications.....	14
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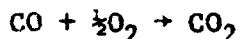
#### Pigment Data Sheets

## NEW JERSEY ZINC-ASHTABULA CHLORIDE TITANIUM DIOXIDE PLANT

### Process Description

#### Chemistry

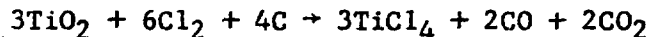
Basically titanium dioxide is produced by the "burning" of pure titanium tetrachloride. Heat is required to heat the reactants up to reaction temperature and is supplied by burning CO.



Additives are also co-burned with the  $\text{TiCl}_4$  to influence the crystallography of the pigments.

The basic crystal of  $\text{TiO}_2$  is then aftertreated to produce a more effective pigment. Aftertreatment consists of coating the surface of the  $\text{TiO}_2$  crystals with certain chemicals. The chemicals used and their amounts depend on the final use to which the pigment is to be put. The aftertreatment is analogous to the aftertreatment used in the sulfate titanium dioxide process but it is modified to optimize the chloride type base pigment.

Titanium tetrachloride is produced by chlorinating a rutile ore (95%  $\text{TiO}_2$ ) or an upgraded ilmenite (UGI) in the presence of carbon.



The  $\text{TiCl}_4$  is purified by chemical treatment and distillation to provide a suitably pure  $\text{TiCl}_4$  for use in the  $\text{TiO}_2$  oxidation.

It should be noted that the chlorine produced in the oxidation step is used for the chlorination step. Net chlorine usage is determined by the process efficiency and the kind and amount of impurities in the rutile containing inlet ore.

In the "chlorination area" rutile ore or upgraded ilmenite (UGI), coke and chlorine gas are reacted in a fluidized bed reactor to produce a mixture of  $\text{TiCl}_4$ , CO,  $\text{CO}_2$  and miscellaneous metal chlorides. The  $\text{TiCl}_4$  and metal chlorides are condensed in the "condensation and purification area", chemically treated to remove impurities that cannot be economically removed by distillation and then distilled to its ultimate purity.

In the "oxidation area",  $\text{TiCl}_4$  is reacted with oxygen in a "burner". Although the reaction is exothermic, heat must be supplied

to heat the  $\text{TiCl}_4$  and  $\text{O}_2$  to the desired reaction temperature which is in excess of  $1100^\circ\text{C}$ . This heat is supplied by reacting  $\text{CO}$  and  $\text{O}_2$  in the "burner" along with the  $\text{TiCl}_4$ - $\text{O}_2$  reaction mixture. Additives are also introduced into the "burner" to control the crystallography of the  $\text{TiO}_2$  particles. The hot reaction mass containing submicron particles of  $\text{TiO}_2$ ,  $\text{Cl}_2$ ,  $\text{CO}_2$  and some excess  $\text{O}_2$  then flows to the "cooling and collection area" where it is cooled in tubular type heat exchangers and the solid  $\text{TiO}_2$  is separated from the gaseous fluids in bag filters. The gases then flow to the "chlorine recovery area" and the solid  $\text{TiO}_2$  base pigment is transferred to the "aftertreatment area".

In the "chlorine recovery area" the gases are passed through an absorption system and then the chlorine free gases are vented to atmosphere. The chlorine is stripped from the absorbent and sent to the chlorination reactors.

In the "aftertreating" area the base pigment is chemically coated with hydrated metal oxides. The final product is then micronized and sent to bagging.

The "bagging area" is considered part of the basic process since the pigment has highly active sites and should receive a minimum of physical handling.

Since Montedison is well versed in wet aftertreatment, a detailed discussion of this portion of the plant will not be discussed herein.

#### $\text{TiCl}_4$ Area

Rutile ore or upgraded ilmenite (UGI) received by ship is transferred from its storage area at the unloading dock by truck to the  $\text{TiCl}_4$  plant. Coke is received in hopper rail cars. Both are unloaded into a track hopper and are transferred by belt conveyor and bucket elevator to separate storage silos. Coke and rutile are batch weighed, on a semi-continuous basis, from their respective silos, in a fixed weight ratio of rutile or UGI to coke. The weighed batches of rutile or UGI and coke are transported by a short belt conveyor that empties into the boot of a bucket elevator and lifts the material to the main distributing belt conveyor. Material on this conveyor is discharged to a primary feed bin mounted above each reactor. An emergency bin is also available on each reactor to provide reactants (coke or rutile) to alter the bed composition if necessary. These solids from the feed bin are delivered automatically to the reactor by a screw conveyor operating from a weigh controller system.

Recovered chlorine is received from the  $\text{TiO}_2$  plant principally in liquid form as are the make-up quantities received from outside suppliers. The liquid chlorine is fed to a train of vaporizers. The

train consists of a steam-heated vaporizer, separator, filters and superheater. Chlorine as a saturated vapor, leaves the steam-heated vaporizer(s), passes through a special  $\text{Cl}_2$  filter, and is then superheated prior to its introduction through the specially designed distributor into the reactor.

The reactor initially is preheated by burning coke with combustion air supplied by one or more of several startup blowers. When the temperature reaches the desired startup level, rutile and coke in the correct proportions are fed to the reactor and maintained in a fluidized state. During this establishing of the "bed" the temperature is then increased to the reaction temperature. During this startup phase, the products of combustion are vented to atmosphere through a special vent upstream of the separators. When the bed has been formed and the reaction temperature is achieved,  $\text{Cl}_2$  vapor is admitted to the reactor soon after the startup blowers and startup vent system have been secured.  $\text{TiCl}_4$  vapor and other reactor products (as well as some entrained coke and unreacted rutile) now leave the reactor and pass into the separators. The reactor is now considered to be "on-stream".

The hot  $\text{TiCl}_4$  vapors and other gases from the chlorinator enter the top of the separator or spray quencher where entrained solids are collected and periodically dumped through a rotary valve into a water sluice. From the sluice, water carries them to a rutile recovery system. The rutile is recovered and recycled.

The vapors leaving the separators, where they have been partially cooled by liquid  $\text{TiCl}_4$ , pass through a three-stage condensation train where the gas stream is cooled and condensed by direct contact with cooled  $\text{TiCl}_4$ . The first condenser in this train is a countercurrent spray tower fitted with spray nozzles. The product gases enter the bottom of the tower and leave the top having been cooled by the liquid  $\text{TiCl}_4$ , which is sprayed into the top of the tower and leaves the bottom. Approximately 75% of the  $\text{TiCl}_4$ , and practically all of the Fe, Zr and Al chlorides, are condensed and removed from the gas stream in this stage. All the liquid from this stage flows by gravity to an agitated tank from which the recirculating portion is passed through a water-cooled heat exchanger prior to its return to the tower sprays. The excess is pumped to a crude storage tank. The product gases leaving the first stage enter the bottom of the second condensation stage and leaves the top of the tower. This stage is also operated countercurrently. The gases are cooled by a liquid  $\text{TiCl}_4$  spray entering the top and leaving the bottom. About 90-95% of the remaining  $\text{TiCl}_4$ , Cr and V are condensed and removed from the gas stream in this stage. The liquid accumulation in this tower gravitates to another agitated recirculating tank from which it is pumped through a water-cooled exchanger where the temperature of the liquid is reduced before re-entering the tower.

The product gases leaving the second stage, enter the third and final condensation stage, a packed tower which is also operating in countercurrent flow. The gases entering the bottom of the tower at 104°F, leave the top of the tower at approximately 3°F, having been cooled by a recirculating liquid  $\text{TiCl}_4$  stream which enters the top of the tower at 0°F and leaves the bottom at approximately 15°F. Again about 90-95% of the remaining  $\text{TiCl}_4$  and metal contaminants are condensed and removed here. The liquid falls to the agitated recirculation tank from whence it is pumped through refrigerated brine coolers and chilled from 15°F to 0°F prior to being admitted back into the column. The exhaust gases now practically  $\text{TiCl}_4$  free, pass through a demister where any additional or entrained  $\text{TiCl}_4$  in the form of liquid droplets is removed. The non-condensable gases continue further to a 200 ft. vent stack where they are released to atmosphere.

The crude  $\text{TiCl}_4$  product condensed and collected in the second and third stage tanks is routed to the first stage recirculating tank and thence on to crude storage.

From the crude  $\text{TiCl}_4$  storage tank, the liquid is pumped to the chemical treatment area where most of the vanadium and other trace metal contaminants are removed by use of a paraffin base oil.

The semi-purified product from the chemical treatment is pumped to the distillation feed tank. From the feed tank, the  $\text{TiCl}_4$  is pumped through an interchanger where it is preheated prior to being introduced to the carbon removal column. This column is designed to remove certain hydrocarbons as a preliminary distillation phase. Heat for boil-up in the column is supplied by hot Therminol in the reboiler. The vapors leave the top of the column and are condensed in a water-cooled exchanger. The condensate leaving the exchanger is split, part of the product is returned to the carbon column as a reflux stream, and the remainder passes on to the stripping column as the feed stream. The bottoms from each column are pumped to sludge feed tanks for further processing. The carbon-free  $\text{TiCl}_4$  enters the stripping column. This column is designed to remove most of the light materials such as  $\text{SnCl}_4$  and  $\text{SiCl}_4$ . The finished product, stripped of impurities, is removed from one of the trays near the bottom of the column and is pumped through an interchanger, where it is cooled enroute to storage in one of twelve pure product storage tanks. The vapors (light ends and  $\text{TiCl}_4$ ) leaving the top of the stripper pass through one of a pair of water-cooled exchanger, are condensed, and the major portion of the liquid stream is returned to the column as reflux. All of the non-condensibles and entrained  $\text{TiCl}_4$  leaving the condensing stages of both columns (carbon and stripper) pass on to a refrigerated brine condenser. The remainder of the overhead stream joins the condensate from the brine condenser and both serve as feed stock to the tin enriching column. Heat exchanger medium for the reboilers in all the distillation columns is hot Therminol. The tin enriching column is designed to concentrate the tin chloride in

the overheads, and return the  $\text{TiCl}_4$  (as bottoms) to the process, thereby minimizing  $\text{TiCl}_4$  losses. The vapors which contain the enriched tin concentrate are taken overhead and condensed in a water-cooled exchanger where a small cut is sent to waste disposal. The major portion is returned to the column as the reflux stream. The bottoms, now reduced in tin chloride, are returned to the stripping column as a part of its feedstock. The pure  $\text{TiCl}_4$  product sent to storage normally contains less than 100 ppm impurities and is primarily consumed at the oxide plant in the production of  $\text{TiO}_2$  pigments, while a smaller volume is relegated to outside sales.

At the treatment and disposal area, the waste materials, some of which are water soluble, are treated with a 4% lime solution, enroute to a clarifier, to neutralize the chlorides. In the clarifier, the floc formed by the lime treatment and the solids slowly settle out in the compartment. The clarified liquid overflows the weirs and is sent to the settling ponds. The settled sludge is continuously "raked" from the bottom of the clarifier and is pumped to two (2) rotary vacuum filters where it is dewatered. The filtrate is sent back to the clarifier for further processing. The dewatered sludge is conveyed by belts to waiting trucks to be taken to a stockpile for possible future reclamation and reprocessing.

#### Oxides Area

This part of the plant produces pigment grade titanium dioxide by reacting titanium tetrachloride with oxygen in a carbon monoxide-oxygen flame at temperatures in excess of  $1100^\circ\text{C}$ . For the purpose of describing the process more easily, the plant is divided into three areas as follows:

Utility and Burner Feed Preparation Area  
Oxidation and Collection Area  
Chlorine Recovery Area

#### Utility and Burner Feed Preparation Area

In this area operating inventories of the liquid raw materials and process materials are received, stored and supplied to the process as required.

Titanium tetrachloride is received by pipeline from the  $\text{TiCl}_4$  plant and is stored in 20,000 gal. steel tanks from which it is moved to process by a centrifugal feed pump.

Chemical additives are stored and transferred to the process as required.

Carbon monoxide is generated in a standard "Wellman" gas producer which has been modified to omit the addition of steam to the feed

gas. The raw materials used in forming the CO gas consist of: (a) coke having a high fusion point ash. The coke is received in hopper cars and is unloaded into a track hopper from whence it is transported by belt conveyor and bucket elevator to a 600,000 lb. coke storage silo. This track hopper and conveying system is also used for transferring coal (for steam generation) to the coal storage silo. (b) Oxygen which is received, "over-the-fence", via pipeline at a moderate pressure and at quantities sufficient to satisfy the entire plant needs. (c) Carbon dioxide, for which the primary source is generated by the plant through the combustion of oil and oxygen and for which a secondary source is maintained (in a liquid phase) in storage for emergency use only. The  $\text{CO}_2$  manufactured by the plant, after leaving the  $\text{CO}_2$  generator, flows to a quench tower where it is cooled by water spray. The gas is further reduced in temperature by passing it through a Freon-cooled exchanger prior to its being admitted to the CO generator.

The coke is taken from its silo as needed for the CO producer and is dried in a rotary calciner before being transferred to the fuel bin atop the generator.

Other components in the gas stream are  $\text{CO}_2$ ,  $\text{H}_2\text{O}$  and  $\text{H}_2$ . The product gases are water quenched in a tower. Particulates and other contaminants are removed in the next series of hydro and cycoil filters. The product gases leaving the filters are subsequently dried in a tower before passing on to the CO preheater. The drying tower is serviced by a dehydration package.

As indicated earlier, titanium tetrachloride is supplied to the feed gas preparation area by a feed pump. The liquid is pumped under automatic level control to the  $\text{TiCl}_4$  vaporizers which are horizontal shell and tube reboiler type units. Heat for vaporization of the  $\text{TiCl}_4$  is supplied by steam for which the flow is controlled by maintaining a constant  $\text{TiCl}_4$  pressure. The vaporizers also receive an automatically flow controlled liquid stream of additives which are vaporized with the  $\text{TiCl}_4$ . Vapors leave the vaporizer, under automatic flow control and pass through steam traced lines enroute to joining the preheated oxygen stream feed to the burner.

Aluminum chloride is screw fed in pellet form from storage bins to steam-heated sublimers. The  $\text{AlCl}_3$  is sublimed by passing a measured flow of nitrogen over the hot agitated  $\text{AlCl}_3$ . The vaporized  $\text{AlCl}_3$  is then fed into the carrier oxygen stream where it is transported to the burner.

The oxygen which carries the  $\text{TiCl}_4$  and additive vapors to the oxidation burner is called primary oxygen and also serves as a reactant for forming the pigment. Sufficient excess  $\text{O}_2$  is supplied to insure that complete and rapid reaction is achieved. The oxygen stream is preheated by shell and tube exchangers.

Carbon monoxide (CO) is pressure-flow controlled from the CO area to the burner where it mixes with combustion oxygen and provides the necessary heat needed for the reacting of the carrier oxygen and  $\text{TiCl}_4$  streams.

#### Oxidation and Collection Area

In this area, titanium tetrachloride and oxygen (plus additives) are reacted to form  $\text{TiO}_2$  pigment. The reaction is carried out in a single burner-furnace combination. The oxidation furnace is a vertical downflow furnace with the burner on top and lined with three layers of refractory brick. The burner is of all-welded construction and internally water cooled. Pressure at the furnace outlet is carefully controlled. The furnace outlet connects to a refractory lined pipe.

The product and gases leave the reactor and pass through two water-cooled shell and tube heat exchangers arranged in series. These exchangers are equipped with a specially designed nozzle arrangement to minimize fouling. The products leave the exchangers and enter the pigment collection bag filters (arranged in parallel). Greater than 99% of the pigment is separated from the gas stream and retained by the primary filters. The product gases continue on for further processing.

The pigment deposited on the filter bag is shaken loose by an environmental gas purge, initiated by a high pressure dry air pulse, and falls into the hopper below. The titania collected in the bag filter hoppers passes out the bottom of the units through individual rotary lock valves and flows by gravity to a product surge bin. This bin has a double set of rotary locks at the bottom through which the pigment flows to the aftertreatment section. The surge bin and the rotary locks are purged with a stream of dry air which is returned to the collection system for reclamation of any entrained product. The pigment from the surge bin is either slurried or passed dry to the aftertreatment area.

The chlorine rich product gases, virtually pigment free, leave the bag filters and are routed to a pair of "back-up" bag filters to remove any traces of pigment from the stream. The "clean" chlorine rich stream then proceeds to the first stage of the chlorine recovery area.

#### Chlorine Recovery Area

Briefly, this process involves the absorption of chlorine in sulfur monochloride (which produces a liquid solution of sulfur monochloride and sulfur dichloride) followed by the desorption of the chlorine from the mixture by heating to regenerate chlorine and sulfur monochloride.

The feed stream to the chlorine recovery area is the  $\text{Cl}_2$  rich off-gas from the collection system from the feed gas compressor. The feed gas compressor provides the motive power for the gases through the  $\text{Cl}_2$  recovery system. The feed stream which contains a small amount of water, is first dehydrated by passing it through a sulfuric acid drying system.

Sulfuric acid for the drying system is received by tank truck and is transferred to storage tanks. The fresh acid is recirculated by pumps through a water-cooled heat exchanger to a spray system located in a packed drying tower. The acid stream flows countercurrent to the chlorine rich feed gases entering the bottom of the tower. The slightly spent acid leaving the bottom of the tower returns by gravity to its storage tank and is recycled back to the tower. When the concentration of the acid has been reduced to 86%, it is considered "spent" and is promptly discarded. The dehydrated gases leaving the tower first pass through a mist eliminator to remove any entrained droplets, thence to a polishing filter to remove any other liquid contaminants, and finally to the suction side of the feed gas compressor fitted with a recycle loop containing a water-cooled heat exchanger for smoother operation and control.

The gases discharged from the blowers enter the bottom of the main  $\text{Cl}_2$  absorber tower, a column arranged in separated stages having water-cooled heat exchangers as intercoolers between each of the stages. The chilled water used in the intercoolers is provided by vacuum chiller. The absorbing medium (sulfur monochloride, in makeup quantities) is received in tank cars and is transferred to its storage (and surge tank) from which it is pumped to the top of the first stage in the main absorber tower. Chlorine in the entering gas stream is absorbed by the monochloride liquid forming sulfur dichloride and thereby releasing a great quantity of heat which is removed by the chilled water of the intercoolers. The  $\text{Cl}_2$  enriched dichloride solution continues by gravity down the absorber column through each stage to the rich solution surge tank which also serves as the feed tank to the chlorine desorber column.

The gases, now practically depleted of chlorine, pass out the top of the absorber column and enter the bottom of a second (but smaller) column. Here the gases are met by a countercurrent stream of refrigerated lean monochloride which removes the remaining chlorine from the stream. The  $\text{Cl}_2$  free gases continue out the top of a second absorber, pass through a knockout drum to remove any liquid droplets of monochloride, and continue on to a 250 ft. stack where they are vented to atmosphere. The cold monochloride returns to the lean mono surge tank.

The chlorine rich mixture of sulfur dichloride and sulfur monochloride is fed from a surge tank by a pump to the feed plate of the chlorine desorber. Before the liquid is admitted to the column, however, it is preheated by passage through an interchanger for which the heating medium is the bottoms from the desorber.

The desorber is a vertical column. The preheated liquid feed mixture is admitted in the vicinity of the middle of the column. Heat for boil-up in the column is supplied by condensation of hot paracymene vapors in the shell and tube reboiler. The hot paracymene vapors are generated in a vaporizer, a gas-fired tube heater.

The sulfur monochloride bottoms product from the chlorine desorber flows under system pressure through the bottoms cooler and the monochloride-dichloride interchanger to the monochloride surge tank which is under desorber pressure. The desorber bottoms cooler serves as a waste heat boiler, in that it produces low pressure steam (150 psig) amounting to the major proportion used in the vacuum water chiller. An interchanger serves as the bottoms product cooler.

The liquid from the lean monochloride surge tank flows under system pressure through a series of exchangers - water cooled, chilled water cooled, and Freon cooled, to the cold mono surge tank. A smaller portion of this stream continues on to the Freon cooled exchanger which further cools the liquid prior to its entry into secondary absorber.

The overhead from the desorber column is pure chlorine vapor which passes through water-cooled exchangers, is practically completely condensed and then flows by gravity to reflux drum. The major portion of the liquefied chlorine is returned to the column as reflux by pump through filter. That portion not returned as reflux is sent to one of four chlorine storage tanks from which it is eventually transferred to the  $\text{TiCl}_4$  plant via pipeline. Chlorine vapor may be transferred directly to the  $\text{TiCl}_4$  plant.

The residual  $\text{Cl}_2$  vapors and non-condensibles leaving the water-cooled exchanger passed through a chilled water condenser which removes the last traces of chlorine and permits the non-condensibles to be recycled back to join the dehydrated feed gas stream for reprocessing before being vented eventually to atmosphere.





AGITATION T.O. Riser

Oxidation

NEW JERSEY ZINC-ASHTABULA CHLORIDE TITANIUM DIOXIDE PLANT

Materials Usage

Consumptions expressed as units per metric ton of pigment product. The average product composition is assumed to be 95.2%  $\text{TiO}_2$ , 3.8%  $\text{Al}_2\text{O}_3$ , 1.0%  $\text{SiO}_2$ .

<u>Materials</u>	<u>Units/Metric Ton of Packed Pigment</u>	
Rutile (95% $\text{TiO}_2$ )	1.109 MT	1.100
Upgraded Ilmenite (90% $\text{TiO}_2$ )	1.242 MT	1.140
Petroleum Coke	0.23 MT/1/	
Oxygen	1.26 MT/2/	1.07
Chlorine	0.519 MT/1/	
Nitrogen	0.05 MT	
Metallurgical Coke	0.13 MT	0.10
$\text{H}_2\text{SO}_4$	0.032 MT	
Aluminum Chloride	0.04 MT	
Chemicals, Chlorination	\$0.28/MT	\$0.35
Chemicals, Oxidation	\$5.00/MT	\$5.40
Lime	0.06 MT	

Utilities

Natural Gas	1100 SCF
Power	850 KWH
Water Cooling, 60°F	150,000 Gal.
Water, Process	16,000 Gal.

- /1/ Based on charging 50% rutile and 50% upgraded ilmenite.  
 /2/ For both burner and CO generation.

NEW JERSEY ZINC-ASHTABULA CHLORIDE TITANIUM DIOXIDE PLANT

Manpower Requirements

Based on Ashtabula experience for a 40,000 ME/year plant.

1. Operating Manpower

	<u>Chlorination</u>	<u>Oxide and Finishing (No Warehouse)</u>
Supervisors and Clerks	7	6
Operators	4/Shift	13/Shift
Daily Workers	1	1
Total	24	59

2. Maintenance

Supervisors and Clerks	8
Mechanics	1/Shift
	44 Daily
Total	55

3. Maintenance Materials

\$34/metric ton of packed pigment.

4. Laboratory - Includes Finished Product Testing

Supervisors and Clerks	2
Shift Workers	3/Shift
Daily Workers	3
Total	17

NEW JERSEY ZINC-ASHIABULA CHLORIDE TITANIUM DIOXIDE PLANT

Raw Material Analyses or Specifications

I. Rutile Ore and Upgraded Ilmenite

	<u>Aust. Rutile</u>	<u>Sierra Leone Rutile</u>	<u>Western Ti UGI</u>	<u>Ishihara UGI</u>
% TiO <sub>2</sub>	94.8	94.8	90.0	95.4
% Fe	0.37	0.82	3.7	1.2
% Mn	--	0.04	1.6	<0.05
% Mg	<0.01	0.02	0.13	0.05
% Ca	<0.2	<0.05	<0.05	<0.05
% Si	0.38	0.40	0.28	0.08
% Zr	1.4	1.0	--	0.06
% +60 Mesh	0.9	33.0	8.0	19.0
% -60 +100	38.2	36.6	72.5	71.4
% -100 +200	60.8	28.4	19.2	9.4
% -200	0.1	2.0	0.3	0.2

II. Coke

	<u>Petroleum Coke</u>	<u>Metallurgical Coke</u>
% Moisture	0.3% Max.	15.0% Max.
% Ash	0.5% Max.	6.5% Max.
% Volatile	0.5% Max.	0.8% Max.
% Fixed Carbon	96.5% Min.	77.0% Min.
% Sulfur	2.5% Max.	0.7% Max.
Size	>4 (Tyler) 0.5% Max.	+1 7.0% Max.
	<28 (Tyler) 4.0% Max.	1/2 x 0 10.0% Max.

III. Treating Oil

Paraffin Base Oil - Mobil No. 2

IV. Aluminum Chloride

AlCl <sub>3</sub>	99.0 Wt. % Min.
Fe	0.008% Max.
Cu	0.004% Max.
Ni	0.005% Max.
Free Al	0.005% Max.
Non-Volatile	0.40% Max.
Mn	<10 ppm
Size: +4 Mesh	0% Max.
-40 Mesh	15% Max.

500 tons per day  
minimum capacity

500 tons per day  
minimum capacity

don't know how to

V. Chlorine

Commercial grade liquid chlorine.

VI. Oxygen

O <sub>2</sub>	99.5% Min. -100°F Dew Point
CO	500 ppm Max.
CO <sub>2</sub>	500 ppm Max.
Hydrocarbons	Zero

VII. Nitrogen

N <sub>2</sub>	99.95% N <sub>2</sub> Min.
O <sub>2</sub>	500 ppm Max.
CO	500 ppm Max.
CO <sub>2</sub>	500 ppm Max.

Exhibit G

# Inter-office Correspondence



Natural Resources Group  
GULF + WESTERN INDUSTRIES, INC.



Location: Ashtabula, Ohio

To: D. A. Towner  
Plant Manager

From: A. C. Steinbronn  
TiCl<sub>4</sub> Unit Superintendent

Date: December 6, 1979

Subject: TiCl<sub>4</sub> Unit Pollution Control Report - November 1979

Average dissolved solids again exceeded the NPDES permit limitation - 5928 vs 5000 ppm and 48281 vs 38000 kg/day. The maximum loading limitation of 57000 kg/day was exceeded on November 20 with an effluent flow of 2.33 MGD and a 6939 ppm concentration. Augmentation of the effluent with Ashco water resulted in an average flow rate of 2.14 MGD.

A pH excursion occurred on November 13, 1979 as a result of the rupture of the lime pump discharge line. About 3500-5000 gallons of lime slurry were discharged before the pump would be shut off, resulting in a high pH for a period of eight (8) hours.

A reportable TiCl<sub>4</sub> spill occurred on November 8, 1979 due to a leak in the distillation column feed pipe.

A trial shipment of about 1200 gallons of a slurry of spray dryer solids in water was made to Koski for off-site neutralization and disposal. Koski will submit a cost proposal at the conclusion of their test.

One batch of spray dryer solids in water was shipped to Smith Chemical Corporation for oxidation and eventual sale as "ferric chloride" as a wastewater treatment chemical. The trial batch assayed at about 6% Fe compared to a desired strength of about 12-13% Fe. Another batch will be prepared in December after modifications to the collection equipment.

A.C. STEINBRONN/bw

copies: T. Paige - Hackensack  
J.F. Smith - Nashville  
A.F. Simmen  
R.A. Schlosser

*Mailes  
12/19/79/xx*

NRG - Environmental Dept.

DEC 21 1979

# Inter-office Correspondence



**Natural Resources Group**  
GULF + WESTERN INDUSTRIES, INC.



Location: Ashtabula, Ohio

To: D. A. Towner  
Plant Manager

From: R. L. Suttman

Date: December 11, 1979

Subject: Pollution Report - Oxide  
November, 1979

The coal boiler particulate system plugged after 6 weeks operation and required a shutdown to clean. The I.D. fan also was cleaned. We continue to investigate possible solutions to this pluggage problem.

The oxide scrubber had an on-stream factor of 98% for the month.

There were no water violations during the month.

A handwritten signature in cursive script, appearing to read 'R. L. Suttman'.

R. L. Suttman

RLS:bw

# Inter-office Correspondence



**Natural Resources Group**  
GULF + WESTERN INDUSTRIES, INC.



Location: Ashtabula

To: D. A. Towner

From: R. L. Suttman

Date: July 6, 1979

Subject: Pollution Report  
Oxide - June, 1979

The coal boiler particulate removal system was taken out of service and cleaned. A build up in the vanes of the unit caused about a 1/2" H<sub>2</sub>O increase in delta P. The Apollo additive agglomerates the fly ash and some of it adheres to the equipment.

The I.D. fan on the boiler also was repaired. The vanes were eroded and there was build up on it also. A new impeller was installed. The boiler returned to normal operation after this repair.

The oxide scrubber was in operation 95% of the time.

There were no water violations during the month.

A handwritten signature in dark ink, appearing to be 'R. L. Suttman'. The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

R. L. Suttman

RLS:bw

# Inter-office Correspondence



Natural Resources Group  
GULF + WESTERN INDUSTRIES INC



Location: Ashtabula, Ohio

To: D. A. Towner

From: A. C. Steinbronn

Date: June 8, 1979

Subject: TiCl<sub>4</sub> Unit Pollution Control Report - May 1979

*JP*  
*S.R.*  
*File*

The dissolved solids concentration exceeded the NPDES permit limitation of 5000 ppm by 945 ppm. Production rates were uniformly high.

There were no emissions or air pollution violations during the month.

A.C. STEINBRONN  
TiCl<sub>4</sub> Unit Superintendent

kr

cc: T. Paige  
J.F. Smith ✓  
A.F. Simmen  
R.A. Schlosser

*6/14/79*  
*RA.*

ORG - Environmental Dept

JUN 18 1979

# Inter-office Correspondence



**Natural Resources Group**  
GULF + WESTERN INDUSTRIES, INC.



Location:

To: D. A. Towner

From: R. L. Suttman

Date: June 8, 1979

Subject: Pollution Report  
May, 1979

The boiler particulate removal system was tested for compliance with the Federal and Ohio EPA representatives present. Preliminary results showed we were in compliance, however, weather conditions were not conducive to "smoke reading" of the stack, so this part of the test will be done later. We do not have people "trained" to smoke read so we are unable to evaluate this part of the test.

The oxide scrubber had a 100% operating factor.

The water effluent had two minor excursions outside the limitations of the permit. A pH of 9.1 vs a 9.0 occurred and an iron content of 4.2 mg/l vs 4.0 mg/l.

The iron upset occurred during the failure of the chlorine condenser when the cooling water dumped to the sewer. The pH was a result of over-compensating for the acids in the effluent.

A handwritten signature in dark ink, appearing to read 'R. L. Suttman'.

R. L. Suttman

RLS:bw

# Inter-office Correspondence



**Natural Resources Group**  
GULF + WESTERN INDUSTRIES, INC.



Location: Ashtabula, Ohio

To: D. A. Towner  
Plant Manager

From: A. C. Steinbronn  
TiCl<sub>4</sub> Unit Superintendent

Date: May 9, 1979

Subject: TiCl<sub>4</sub> Unit Pollution Control Report - April 1979

The NPDES permit was exceeded with respect to average suspended solids concentration and maximum lead concentration.

The average TSS concentration was 26.5 ppm compared to a permit condition of 25.0 ppm. A anionic polymer was substituted for the previously used cationic polymer early in the month. This polymer appears more efficient, however, it is also much more viscous than the cationic polymer. This has caused problems in getting the polymer into solution, and in adding the solution to the thickener at the proper rate.

The lead concentration of the April 26 sample was 0.24 ppm compared to the permit condition of 0.20 ppm. The loading, i.e., kg/day, was within the limits due to a lower than normal flow rate.

A.C.STEINBRONN

kr

copies T.Paige - Palmerton  
✓ J.F.Smith - Nashville  
R.A.Schlosser  
A.F.Simmen

NRG - Environmental Dept.

MAY 22 1979

**Inter-office  
Correspondence**



**Natural Resources Group**  
GULF + WESTERN INDUSTRIES, INC.



Location:

To: D. A. Towner

From: R. L. Suttman

Date: May 8, 1979

Subject: Pollution Report  
April, 1979

The boiler particulate removal system was tested and with Apollo additives was found to reach acceptable particulate levels. A different size coal recommended by our supplier will be tried, since coal quality affects the particulate levels.

The oxide scrubber had a 100% operating factor.

Water effluent was satisfactory.

A handwritten signature in cursive script, appearing to read 'R. L. Suttman'.

R. L. Suttman

RLS:bw

# Inter-office Correspondence



Natural Resources Group  
GULF + WESTERN INDUSTRIES, INC.



Location:

To: D. A. Towner

From: A. C. Steinbronn

Date: April 4, 1979

Subject: TiCl<sub>4</sub> Unit Pollution Control Report - March 1979

The NPDES permit limitations were exceeded with respect to both pH and suspended solids.

On March 16, the pH reached 5.6 standard units and was below the EPA limit of 6.0 for approximately 30 minutes. A truck delivering lime to the plant hit and ruptured a caustic pipeline. The caustic was diverted to the neutralization system, and lime was manually valved off to prevent exceeding the upper pH limit. A delay in the re-activation of the automatic lime system resulted in the low pH.

The rate of oxidation of iron from the ferrous to the ferric state is both temperature and pH related. In order to expedite this oxidation rate, a blower was installed in February to aerate the waste stream, and the pH was maintained at a slightly higher than normal level. These steps have kept the iron within specifications; however, the efficiency of the cationic polymer employed as a settling aid is slightly reduced at the higher pH. As a result, fine suspended particles escaped the thickener leading to an average TSS concentration of 37 ppm and an average loading of 255 kg/day compared to NPDES permit limits of 25 ppm and 190 kg/day.

The supplier of the polymer, Mogul Corporation, is assisting us in finding a settling aid which is more efficient in cold water and at a higher pH than the one presently in use.

Dissolved solids were within specification primarily due to periods of low production caused by operating problems. Utilization of dried Indian UGI and substitution of Australian rutile (95% TiO<sub>2</sub>) for the lower grade QIT rutile were contributing factors in meeting EPA limits.

  
A. C. Steinbronn

ACS:bw

cc: TPaige - Palmerton  
JFSmith - Nashville ✓  
RASchlosser  
AFSinnen

NRG - Environmental Dept.

APR 12 1979

# Inter-office Correspondence



**Natural Resources Group**  
GULF + WESTERN INDUSTRIES, INC.



Location:

To: D. A. Towner

From: R. L. Suttman

Date: April 6, 1979

Subject: Pollution Report - Oxide  
March, 1979

The revised coal boiler particulate removal system was tested and found to be only slightly improved over the original. Additives did not improve the conditions, however, one test using an Apollo additive did show promise. It is to be retested shortly.

Apollo reported that their original data was in error with respect to particle size. Particle size was actually much smaller than reported.

The oxide scrubber had a 95.8% operating factor.

The water effluent was within specification during the month.

A handwritten signature in dark ink, appearing to read 'R. L. Suttman'.

R. L. Suttman

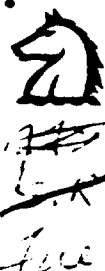
RLS:bw

# Inter-office Correspondence



Natural Resources Group

GULF - WESTERN INDUSTRIES INC.



Location: Ashtabula

To: D. A. Towner

From: A. C. Steinbronn

Date: March 7, 1979

Subject: TiCl<sub>4</sub> Unit Pollution Control Report - February, 1979

NPDES permit conditions were met for the second consecutive month. Production was low, 10% below Plan, and Indian UGI usage was also below normal.

A small blower has been installed to inject air below the surface of the 4th stage of the neutralization system in order to increase the oxidation rate of iron. Iron must be changed from the ferrous to the ferric valence state to allow the removal by settling.

There were no emissions during the month.

A handwritten signature in cursive script, appearing to read 'A.C. Steinbronn'.

A. C. Steinbronn

ACS:bw

cc: TPaige - Palmerton  
JFSmith - Nashville ✓  
RASchlosser  
AFSimmen

RECEIVED MAR 12 1979

# Inter-office Correspondence



Natural Resources Group  
GULF + WESTERN INDUSTRIES, INC.



To: D. A. Towner

Location: Ashtabula, Ohio

From: A. C. Steinbronn

Date: February 9, 1979

Subject: TiCl<sub>4</sub> Unit Pollution Control Report - January 1979

The NPDES permit conditions were met in all respects, primarily due to periods of low production rate.

There were no emissions during the month.

A.C. STEINBRONN  
TiCl<sub>4</sub> Unit Superintendent

kr

cc T. Paige - Palmerton  
J.F. Smith - Nashville ✓  
R.A. Schlosser  
A.F. Simmen

RECEIVED FEB 16 1979

# Inter-office Correspondence



**Natural Resources Group**

GULF + WESTERN INDUSTRIES, INC.



Location:

To: D. A. Towner

From: R. L. Suttman

Date: February 8, 1979

Subject: Pollution Report - Oxide  
January, 1979

The revision in the coal boiler particulate removal system has not been started. The internal parts were to be delivered 1/15/79 but have not been received. They are scheduled for early February.

Oxide scrubber was on line 98.2% of the time.

Water effluent has been within specification.

A handwritten signature in black ink, appearing to be 'R. L. Suttman'.

R. L. Suttman

RLS:bw

# Inter-office Correspondence



**Natural Resources Group**

GULF + WESTERN INDUSTRIES, INC.



Location: Ashtabula, Ohio  
Chemicals Division - Titanium

To: D. A. Towner

From: A. C. Steinbronn

Date: June 1, 1978

Subject: TiCl<sub>4</sub> Unit Pollution Control Report - May 1978

## Air Pollution

The scrubber had a 100% on-stream factor.

## Emissions

None during the month.

## Water Pollution

There were no violations of the NPDES permit.

A.C. STEINBRONN/kr

cc: T. Paige - Bethlehem  
D.R. Baker - Bethlehem ✓  
J.F. Smith - Bethlehem  
H.A. Kiskadden  
R.A. Schlosser

# Inter-office Correspondence



**Natural Resources Group**  
GULF + WESTERN INDUSTRIES INC



Location:

To: D. A. Towner

From: R. L. Suttman

Date: June 6, 1978

Subject: Pollution Report - Oxide  
May, 1978

The coal boiler particulate removal compliance tests were conducted in May. Preliminary findings show the unit to be out of range of compliance. Evolution from the stack showed 25 to 35 lbs./hr. while compliance requirements show less than 20 lbs./hr.

Oxide scrubber operating factor was 98.3%.

Water effluent was within specifications.

Pollution costs were favorable by \$5,000. Maintenance labor and materials were favorable by \$4,900.

A handwritten signature in black ink, appearing to be 'R. L. Suttman'.

R. L. Suttman

RLS:dkm

# Inter-office Correspondence



**Natural Resources Group**  
GULF + WESTERN INDUSTRIES, INC.



Location: Ashtabula, Ohio  
Chemicals Division - Titanium

To: D. A. Towner

From: A. C. Steinbronn  
TiCl<sub>4</sub> Unit Superintendent

Date: May 3, 1978

Subject: TiCl<sub>4</sub> Unit Pollution Control Report - April, 1978

# Inter-office Correspondence



**Natural Resources Group**  
GULF + WESTERN INDUSTRIES INC



Location:

To: D. A. Towner ✓

From: R. L. Suttman

Date: May 8, 1978

Subject:  $\text{TiO}_2$  Pollution Control Report

A coal boiler particulate removal compliance test is scheduled for early May. Preliminary tests have been conducted on the removal system to determine the best method of operation.

The operating factor for the oxide scrubber was 100%.

Water effluent was in specification.

Costs for the pollution account were unfavorable by \$9900. Excess lime (\$6300) and maintenance material (\$6200) were the overruns.

A handwritten signature in black ink, appearing to be 'R. L. Suttman'.

R. L. Suttman

RLS:bw

# Inter-office Correspondence



**Natural Resources Group**  
GULF + WESTERN INDUSTRIES, INC.



Location:

To: D. A. Towner

From: R. L. Suttman

Date: April 13, 1978

Subject: TiO<sub>2</sub> Pollution Control Report  
March 1978

With the coal strike at an end we will now establish a compliance test for the coal boiler particulate removal system.

The oxide scrubber was in operation 97.7% of the time.

Water effluent has been in specification through the month. We have requested a renewal of our water permit.

Pollution costs were unfavorable by \$2700. This was primarily due to purchase of lime (\$3100) above budget.

A handwritten signature in black ink, appearing to be 'R L Suttman'.

R. L. Suttman

RLS:bw

INTER-OFFICE  
CORRESPONDENCE

GWS

G+W NATURAL RESOURCES GROUP  
CHEMICALS DIVISION - TITANIUM  
ASHTABULA PLANT

TO D. A. Towner AT

FROM A. C. Steinbronn DATE March 2, 1978

SUBJECT TiCl4 Unit Pollution Control Report  
February 1978

Air Pollution

The scrubber had a 100% on-stream factor.

Emissions

There were no emissions during the month.

Water Pollution

There were no violations of the NPDES permit.

The thickener upsets experienced during the last several months appear to be due to excess turbulence caused by increased flow rate. It has been recommended that the feed to the thickener be introduced through an open flume with 45° baffles. This should reduce the turbulence, yet provide adequate mixing of the polymer. This modification will be made when the weather improves.



A. C. Steinbronn

ACS:bw

cc: T. Paige  
D.R. Baker ✓  
J.F. Smith  
H.A. Kiskadden  
R.A. Schlosser

3-13-78  
NE

INTER-OFFICE  
CORRESPONDENCE

G+W NATURAL RESOURCES GROUP  
CHEMICALS DIVISION - TITANIUM  
ASHTABULA PLANT

TO D. A. Towner

AT

FROM R. L. Suttman

DATE March 8, 1978

SUBJECT  $\text{TiO}_2$  Pollution Control Report  
February, 1978

The boiler particulate removal system continues to operate. We have asked for a delay in the compliance testing, but have not received a response from the EPA.

The oxide scrubber was on-line 100% of the time.

Water effluent has been within specification. Measurement problems have continued but to a lesser degree.



R. L. Suttman

RLS:bw

# Inter-office Correspondence



**Natural Resources Group**  
GULF + WESTERN INDUSTRIES, INC.



**Location:** Chemicals Division - Titanium  
Ashtabula, Ohio

**To:** D. A. Towner

**From:** A. C. Steinbronn

**Date:** April 5, 1978

**Subject:** TiCl<sub>4</sub> Unit Pollution Control Report - March 1978

## Air Pollution

The scrubber had a 100% on-stream factor.

## Emissions

There were no emissions.

## Water Pollution

There were no violations of the NPDES permit.

*April 13 - 1978 KR*  
A.C. STEINBRONN/kr

cc: T. Paige  
D. R. Baker ✓  
J. F. Smith  
H. A. Kiskadden  
R. A. Schlosser

APR 17 1978

INTER-OFFICE  
CORRESPONDENCE

G+W NATURAL RESOURCES GROUP  
CHEMICALS DIVISION - TITANIUM  
ASHTABULA PLANT

TO D. A. Towner AT Ashtabula

FROM A. C. Steinbronn DATE February 7, 1978  
TiCl<sub>4</sub> Unit Superintendent

SUBJECT TiCl<sub>4</sub> Unit Pollution Control Report - January 1978

Air Pollution

The scrubber had a 100% on-stream factor.

Emissions

There were no emissions during the month.

Water Pollution

There were no violations of the NPDES permit.

The thickener has been in an upset condition for some time. We have been working with Dearborn Chemical Company, the flocculant supplier, to rectify the problem. Numerous polymers have been tried, as well as various concentrations. Competitive polymers have also been tried. At this point, it appears tha excessive turbulence has caused the floc to break up, and the addition has been relocated.

A.C.STEINBRONN/kr

cc: T.Paige  
D.R.Baker ✓  
J.F.Smith  
H.A.Kiskadden  
R.A.Schlosser

*mailed  
2-13-78 kr*

FEB 10 1978

✓ INTER-OFFICE  
CORRESPONDENCE

G+W NATURAL RESOURCES GROUP  
CHEMICALS DIVISION - TITANIUM  
ASHTABULA PLANT

TO D. A. Towner

AT

FROM R. L. Suttman

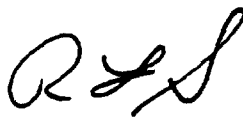
DATE February 9, 1978

SUBJECT Pollution  
January, 1978

The boiler particulate removal system was in operation through the entire month. There is an improvement in the appearance of the stack. Preliminary tests have shown that at proper operating conditions the unit just meets the requirements of the law. We have restricted the steam production of the coal boiler so as to conserve coal, however, the wet-fine coal we are receiving does not allow us to operate the boiler at rates over 45,000 to 50,000 lbs. per hour. We have asked for a delay in the compliance test that we must conduct.

The oxide scrubber operated 97.5% of the time. No major problems have occurred in the system.

Water effluent from the oxide area has been satisfactory. Only a problem with the flow measurement in the severe weather has occurred.



R. L. Suttman

RLS:bw

INTER-OFFICE  
CORRESPONDENCE

G+W NATURAL RESOURCES GROUP  
CHEMICALS DIVISION - TITANIUM  
ASHTABULA PLANT

TO D. A. Towner AT Ashtabula

FROM A. C. Steinbronn DATE January 5, 1978

SUBJECT TiCl<sub>4</sub> Unit Pollution Control Report - December 1977

Air Pollution

The scrubber had a 100% on-stream factor.

Emissions

There were no emissions during the month.

Water Pollution

The NPDES limitation with respect to pH was exceeded on December 10. The rupture disc on the lime storage bin blew while unloading a load of lime. Wind-blown lime dust settled on the effluent ponds resulting in a high pH for a short period of time.

A.C.STEINBRONN/kr

cc: T.Paige - Bethlehem  
D.R.Baker - Bethlehem  
J.F.Smith - Bethlehem  
H.A.Kiskadden  
R.A.Schlosser

1-16-78  
kr.

INTER-OFFICE  
CORRESPONDENCE

G+W NATURAL RESOURCES GROUP  
CHEMICALS DIVISION - TITANIUM  
ASHTABULA PLANT

TO D. A. Towner / AT

FROM R. L. Suttman DATE 1/5/78

SUBJECT  $\text{TiO}_2$  Pollution Control Report

Water effluent control was satisfactory. There were no violations of our permit. We did have an acid spill that required additional neutralization before entry into the stream.

The oxide scrubber was cleaned three times during the month. The operating factor was 94.5%. Only pluggage in the system due to the reaction has been a problem. Since elimination of the steam heating the gas prior to entry into the prehydrolysis chamber we have not experienced corrosion of the titanium impeller.

The coal boiler particulate removal system was completed and put into operation. Preliminary data has shown the secondary gas flow to be less than minimum for efficient operation. The manufacturer is redesigning the drive unit. A series of tests have shown varying results in collection efficiency. The compliance test scheduled for early January was cancelled until these problems have been rectified. A letter is being sent to the Federal EPA requesting an extension of the compliance test date.



R. L. Suttman

RLS:bw

INTER-OFFICE  
CORRESPONDENCE

G+W NATURAL RESOURCES GROUP  
CHEMICALS DIVISION - TITANIUM  
ASHTABULA PLANT

TO D. A. Towner

AT Ashtabula

FROM A. C. Steinbronn

DATE December 6, 1977

SUBJECT TiCl<sub>4</sub> Unit Pollution Control Report - November 1977

Air Pollution

The scrubber had a 100% on-stream factor.

Emissions

There were no emissions during the month.

Water Pollution

The effluent pH was below the NPDES limit of 6.0 for about 75 minutes on November 12, 1977. Failure of two process pumps (GA-426) resulted in a discharge of liquid TiCl<sub>4</sub> to the east pond used to collect rain-water and ground drainage. The water in this pond was pumped by mistake to the effluent settling pond rather than the 4th stage of the neutralization system. The stream was diverted to the neutralization system as soon as the mistake was realized.

The effluent analyses that are to be reported to the EPA were all within specification with respect to zinc. However, several in-plant streams sampled during the month contained zinc in concentrations greater than our permit condition.

Zinc - ppm

Ashco Water	0.055
Oxide Effluent	0.17
East Pond	0.097
Scrubber Discharge	0.055
1st Stage Neutralization	0.25
4th Stage Neutralization	0.64
Spray Dryer Solids (10% Solution)	38

A.C.STEINBRONN/kr

cc: HAKiskadden

RASchlosser

TPaige - Bethlehem

DRBaker - Bethlehem

JFSmith - Bethlehem

INTER-OFFICE  
CORRESPONDENCE

G+W NATURAL RESOURCES GROUP  
CHEMICALS DIVISION - TITANIUM  
ASHTABULA PLANT

TO D. A. Towner AT Ashtabula

FROM R. L. Suttman DATE December 8, 1977  
TiO<sub>2</sub> Unit Superintendent

SUBJECT TiO<sub>2</sub> Unit Pollution Control Report - November 1977

Control of the effluent has been satisfactory. We did have one violation of the NPDES permit in the month of October in zinc level. We have been trying to determine the zinc source, however, its extremely sporadic occurrence has prevented pin pointing the source.

The coal boiler particulate removal system is about complete and is scheduled for start-up by mid December. Bad weather and ill-fitting duct work delayed the start. Two letters concerning the steps in installation program, required by the EPA, were sent to them.

The oxide scrubber operating factor was 98.75%. No significant problems were encountered with the system.



R. L. SUTTMAN/kr

cc: T. Paige - Bethlehem  
J.F. Smith - Bethlehem  
D.R. Baker - Bethlehem

INTER-OFFICE  
CORRESPONDENCE

G+W NATURAL RESOURCES GROUP  
CHEMICALS DIVISION - TITANIUM  
ASHTABULA PLANT

TO D. A. Towner AT Ashtabula, Ohio

FROM A. C. Steinbronn DATE November 3, 1977

SUBJECT TiCl<sub>4</sub> Unit Pollution Control Report - October, 1977

Air Pollution

The scrubber had a 100% on-stream factor.

Water Pollution

The average zinc concentration of 0.055 ppm was above the average NPDES permit limitation of 0.05 ppm, although all of the individual analyses (0.065, 0.060, 0.059, and 0.036 ppm) were well below the maximum limit of 0.68 ppm. The average limitation was also exceeded last month.

Various in-plant streams were analyzed in an effort to locate the source of this contamination.

	<u>Zn - ppm</u>
Mercer Lime	15
Marblehead Lime	26
Ashco Water - 4/14/77	0.029
- 5/12/77	0.053
- 10/07/77	0.012
- 10/27/77	0.010
City Water	0.032
Oxide Effluent	0.17
1st Stage Neutralization	0.14
4th Stage Neutralization	0.25

Lime, based on average daily consumption and an effluent flow of 1.75 MGD, contributes 0.04 and 0.11 ppm Zn from Mercer and Marblehead, respectively. Oxide's effluent, when diluted to 1.75 MGD, amounts to 0.056 ppm.

Samples from the scrubber, the east pond which collects run-off from the mud pile, and spray dryer solids dissolved in water will be analyzed. Some of the streams analyzed in October will also be re-checked.

The solubility of zinc at 9 pH is approximately 0.08 ppm as reported in the "EPA Development Document for Zinc Smelter Guidelines". Therefore, if the zinc content of our waste stream is greater than the 0.05 ppm limit, our chances of removing this zinc in our treatment system are slim.

Lime Slurry

A two-stage neutralization system was tested in the laboratory, using USS Calcite limestone to an intermediate pH of 3.5, and Mercer Lime to the final pH of 8.2. Delivered cost of these limes are \$47.83 and \$17.30/ton for Mercer and USS, respectively. On the basis of this test, the two-stage is not economically advantageous, however, the test will be repeated.

	<u>Lb. Lime per ton S/D Solids</u>	<u>Cost per ton S/D Solids</u>
1. Mercer Lime to 8.2 pH	500	\$11.96
2. USS Limestone to 3.5 pH (@ ambient temperature)	127	\$ 1.10
Mercer Lime to 8.2 pH	490	<u>\$11.72</u>
		\$12.82
3. USS Limestone to 3.5 pH (@ 150°F.)	393	\$ 3.40
Mercer Lime to 8.2 pH	370	<u>\$ 8.85</u>
		\$12.25

Emissions

There were no emissions during the month.

  
A.C. STEINBRONN/kr

cc: HAKiskadden  
    RASchlosser  
    FAOlson - Gloucester City Office  
    TPaige - Bethlehem Office  
    DRBaker - Bethlehem Office ✓  
    JFSmith - Bethlehem Office

11-18-77  
KOR

NOV 9 1977

G+W Natural Resources Group  
Chemicals Division — Titanium  
ASHTABULA

ROUTE ORDER	NAME	LOCATION	CHECK
1	<i>D. L. Baker</i>		
2			
3			
4			
5			
6			

FROM

*Katke Hunt*

*7-18-77*

RETURN ☐

NEED NOT RETURN ☐

NOTE: *See Sam -*

*This is the only report this month.  
Next month w/B Tidy plus  
updated  $P_{102}$  Report.  
Thanks.*



**Natural  
Resources  
Group**

GULF + WESTERN INDUSTRIES

P.O. Box 160  
Ashtabula, Ohio 44004  
(216) 997-5501

Chemicals Division - Titanium

June 30, 1977

TO: F.R.Mohrmann  
FROM: A.C.Steinbronn  
SUBJECT: TiCl<sub>4</sub> Unit Pollution Control - June 1977

Air Pollution

The scrubber had a 100% on-stream factor.

Water Pollution

There was one violation during the month with respect to pH (June 18, 1977). The low level alarm in the lime storage tank malfunctioned and the tank went empty. This failure was discovered when the low pH alarm in the 3rd stage of the neutralization system sounded. Caustic was immediately added, and fresh lime made up and added to the system. Nevertheless, the effluent pH reached a low point of 5.0, and was below the permit limit of 6.0 for about one hour.

Emissions

There were no emissions during the month.

*A.C. Steinbronn*

A.C.Steinbronn  
TiCl<sub>4</sub> Unit Superintendent

kr

cc: D.R.Baker ✓  
J.F.Smith  
T.Paige

7-18-77  
xR.



**Natural  
Resources  
Group**

GULF + WESTERN INDUSTRIES

P.O. Box 160  
Ashtabula, Ohio 44004  
(216) 997-5501

Chemicals Division - Titanium

June 1, 1977

TO: F. R. Mohrmann  
FROM: A. C. Steinbronn  
SUBJECT: TiCl<sub>4</sub> Unit Pollution Control - May 1977

Air Pollution

The scrubber had a 100% on-stream factor.

Water Pollution

There were no violations of the NPDES permit.

Various effluent sources at both the Oxide and TiCl<sub>4</sub> Units were sampled and analyzed for zinc. High levels were found in the hydrated lime purchased from Mercer Lime Company and in the waste lime slurry from Union Carbide.

NPDES Permit	0.05 ppm Zn (avg.)
Dry lime	14.0 ppm
Oxide lime slurry	0.80 ppm
TiCl <sub>4</sub> lime slurry	0.75 ppm
U.C. waste lime slurry	0.16 ppm

Emissions

There were no emissions during the month.

*A.C. Steinbronn*  
A.C. STEINBRONN/kr

cc: B.G. OConnell  
D.R. Baker  
J.F. Smith  
T. Paige

*Made  
6-14-77-KR*

**Inter-office  
Correspondence**

**GW** The New Jersey Zinc Company  
A GULF - WESTERN COMPANY



**NJZ**

To: F. R. Mohrmann

At:

From: B. G. O'Connell

Date: June 7, 1977

Subject:  $\text{TiO}_2$  Monthly Pollution Report  
May, 1977

1. The scrubber onstream factor for the month was 96.29.
2. There were no violations of NPEDS permit during May. Although zinc did not show up on any of the sample days, a program has been started which will pinpoint the source of zinc in the effluent

*B. G. O'Connell*

B. G. O'Connell

bw

G+W NATURAL RESOURCES GROUP  
CHEMICALS DIVISION - TITANIUM  
ASHTABULA PLANT

TO: F. R. Mohrmann  
FROM: A. C. Steinbronn  
AT: Ashtabula, Ohio  
DATE: May 4, 1977  
SUBJECT: TiCl<sub>4</sub> Unit Pollution Control - April 1977

Air Pollution

The scrubber had a 100% on-stream factor.

Water Pollution

There was no violation of the NPDES permit.

The Oxide effluent stream pumped to the TiCl<sub>4</sub> Unit was sampled once per shift during the first 22 days of the month, and the resulting composite was analyzed for the NPDES permit parameters.

	NPDES Permit Condition	Oxide Effluent As Received	4:1 Dilution
Chromium	0.2 ppm (max.)	0.75 ppm	0.15 ppm
Lead	0.2 ppm (max.)	0.2 ppm	0.04 ppm
Zinc	0.05 ppm (avg.)	0.54 ppm	0.11 ppm
Iron	2.0 ppm (avg.)	10.4 ppm	2.1 ppm

Assuming that Oxide's effluent of about 250 gpm is diluted to 1250 gpm by TiCl<sub>4</sub> Unit effluent, the zinc concentration in the total effluent would still be 0.11 ppm, well above the average NPDES permit condition. The chromium and iron represent no problem, as these will precipitate in the neutralization system; however, it is highly unlikely that the zinc can be removed at our present pH range.

An effort to locate the source of the zinc contamination has been initiated. Ashco water contains about 0.03 ppm zinc, 60% of our NPDES permit allocation, and Mercer lime slurry used for neutralization has been analyzed at 1.5 and 0.57 ppm. Other sources have not yet been located.

Emissions

There were no emissions during the month.

A.C.STEINBRONN/kr

cc: B.G.OConnell

T. Paige

D.R. Baker

J.F. Smith

5/16/77-KL.

**Inter-office  
Correspondence**



To: F. R. Mohrmann

At:

From: B. G. O'Connell

Date: May 6, 1977

Subject:  $\text{TiO}_2$  Pollution Report  
April, 1977

# Inter-office Correspondence

**GW** The New Jersey Zinc Company  
A DIVISION OF GULF + WESTERN INDUSTRIES, INC.



**NJZ**

To: F. R. Mohrmann

At: Ashtabula, Ohio

From: A. C. Steinbronn

Date: April 6, 1977

Subject: TiCl<sub>4</sub> Unit Pollution Control - March 1977

## Air Pollution

The scrubber had a 100% on-stream factor.

## Water Pollution

The NPDES permit was violated with respect to average zinc content. Three samples taken during the month contained 0.14, 0.055, and 0.025 ppm for an average of 0.073 ppm. Although none of the samples exceeded the maximum permit condition of 0.68 ppm, the average permit condition of 0.05 ppm was violated. During the 15 month period since January 1976, the average zinc content has been 0.029 ppm; only one other than the March sample was greater than 0.1 ppm, and only five others were greater than 0.05 ppm. It is therefore believed that the March result of 0.14 ppm was incorrect either due to sample contamination or faulty analysis.

Mr. Russel Hart of the Ohio EPA visited the plant on March 23. He took two grab samples of the effluent; results on duplicate samples are:

	<u>NPDES PERMIT</u>		<u>MARCH SAMPLES</u>	
	<u>Avg.</u>	<u>Max.</u>	<u>12:10 pm</u>	<u>2:00 pm</u>
TDS	5000	7500	5480	5586
TSS	25	62	9	22
Fe	2.0	4.0	1.8	1.3
Cr	--	0.2	0.04	0.04
Pb	--	0.2	0.17	0.17
Zn	0.05	0.68	0.02	0.04

Since maximum limitation must be applied to grab samples, the effluent was within specification at the time of sampling.

## Emissions

There were no emissions during the month.

A.C.STEINBRONN/kr

cc: D.R.Baker ✓  
J.F.Smith  
T.Paige

4-13-77  
KR

# Inter-office Correspondence

**GW** The New Jersey Zinc Company  
A GULF - WESTERN COMPANY



**NJZ**

To: F. R. Mohrmann ✓

At:

From: B. G. O'Connell

Date: April 11, 1977

Subject: Pollution Report  
March 1977

1. Scrubber

The scrubber onstream factor was 93.6% for the month. The scrubber was down three times during the month - two for cleaning and one for a blower adjustment.

2. The effluent was out of specification on zinc on March 17. The value was .32 ppm vs a spec. of 0.2 ppm max. Since on 3/17/77 the  $\text{TiCl}_4$  Unit's zinc was also high, we suspect a faulty zinc analysis for that date.

B. G. O'Connell

BGO'C:bw

**Inter-office  
Correspondence**

**GW** The New Jersey Zinc Company  
A DIVISION OF GULF + WESTERN INDUSTRIES, INC.



**NJZ**

To: F. R. Mohrmann

At: Ashtabula, Ohio

From: A. C. Steinbronn

Date: February 4, 1977

Subject: TiCl<sub>4</sub> Unit Pollution Control - January 1977

Air Pollution

The scrubber had a 100% on-stream factor. The east blower, GB-458B, was taken off-line after 6 months due to excessive vibration caused by solid deposition on the blades.

Water Pollution

There were no violations of the NPDES permit.

Emissions

There were no emissions during the month.

A.C.STEINBRONN/kr

cc: T.Paige  
D.R.Baker ✓  
J.F.Smith

2-16-77

Ham

**Inter-office  
Correspondence**

**GW** The New Jersey Zinc Company  
A GULF - WESTERN COMPANY



To: F. R. Mohrmann ✓

At:

From: B. G. O'Connell

Date: February 11, 1977

Subject:  $\text{TiO}_2$  Monthly Pollution Report  
January 1977

1. The scrubber had an onstream factor of 93%.
2. Plant effluent was out of specification on zinc one day of the month. The zinc was caused by an unusually high amount of lime. 3  
✓

*B. G. O'Connell*  
*BW*

B. G. O'Connell

BGO'C:bw

**Inter-office  
Correspondence**

**GW** The New Jersey Zinc Company  
A DIVISION OF GULF • WESTERN INDUSTRIES, INC.



To: F. R. Mohrmann

At: Ashtabula, Ohio

From: A. C. Steinbronn

Date: March 4, 1977

Subject: TiCl<sub>4</sub> Unit Pollution Control - February 1977

Air Pollution

The scrubber had a 100% on-stream factor.

Water Pollution

There were no violations of the NPDES permit.

Emissions

There were no emissions during the month.

A.C.STEINBRONN/kr

cc: D.R.Baker  
J.F.Smith  
T.Paige

5-14-77 KK.

**Inter-office  
Correspondence**

**GW** The New Jersey Zinc Company  
A GULF - WESTERN COMPANY



**NJZ**

**To:** F. R. Mohrmann

**At:**

**From:** B. G. O'Connell

**Date:** March 11, 1977

**Subject:**  $\text{TiO}_2$  Monthly Pollution Report  
February, 1977

1. The scrubber onstream factor was 98.37% for the month.
2. The effluent was within state specifications during the month.

Barry G. O'Connell

BGO'C:bw

**Inter-office  
Correspondence**

**GW** The New Jersey Zinc Company  
A DIVISION OF GULF + WESTERN INDUSTRIES, INC.



**NJZ**

**To:** F. R. Mohrmann

**At:** Ashtabula, Ohio

**From:** A. C. Steinbronn

**Date:** January 6, 1977

**Subject:** TiCl<sub>4</sub> Unit Pollution Control - December 1976

**Air Pollution**

The scrubber had a 100% on-stream factor.

**Water Pollution**

There were no violations of the NPDES permit.

**Emissions**

There were no emissions during the month.

A.C.STEINBRONN/kr

1-13-77  
KAR.

cc: T.Paige  
D.R.Baker  
J.F.Smith

**Inter-office  
Correspondence**

**GW** The New Jersey Zinc Company  
A GULF - WESTERN COMPANY



**NJZ**

**To: F. R. Mohrmann**

**At:**

**From: B. G. O'Connell**

**Date: January 13, 1977**

**Subject:  $\text{TiO}_2$  Monthly Pollution Report  
December 1976**

1. The scrubber onstream factor for the month was 93.6.
2. The effluent was within State specifications during the entire month.

*B G O'Connell*  
*Bw*

**B. G. O'Connell**

**BGO'C:bw**

**cc: T.Paige**

**D.R.Baker**

**J.F.Smith**

MEMORANDUM

December 10, 1976

TO: D. R. BAKER

FROM: J. F. SMITH

Re: Telephone Call from Carl Reed - Ashtabula  
Notification of Changes in Company Name

With respect to environmental matters, who should notify authorities of changes in title - should Ashtabula do it or will we do it from here. Presumably, this applies to Gloucester City as well, though I have had no inquiry from them.

  
J. F. Smith

JFS:dmp

MEMORANDUM

December 10, 1976

TO: D. R. BAKER

FROM: J. F. SMITH

Re: Telephone Call from Carl Reed - Ashtabula  
Notification of Changes in Company Name

With respect to environmental matters, who should notify authorities of changes in title - should Ashtabula do it or will we do it from here. Presumably, this applies to Gloucester City as well, though I have had no inquiry from them.

  
J. F. Smith

JFS:dmp

**Inter-office  
Correspondence**

**GW** The New Jersey Zinc Company  
A DIVISION OF GULF • WESTERN INDUSTRIES INC



To: F. R. Mohrmann

At: Ashtabula, Ohio

From: A. C. Steinbronn

Date: November 6, 1976

Subject: TiCl<sub>4</sub> Unit Pollution Report - October 1976

Air Pollution

The scrubber had a 100% on-stream factor. The east blower, GB-458 A, has been in service since July 1.

Water Pollution

There was a violation of the NPDES permit with respect to zinc on October 13. Ther permit limitation is 0.68 ppm, whereas the October 13 concentration was 0.86 ppm. The highest concentration found in the previous 9 months was 0.04 ppm, which makes the high October result rather questionable.

Dissolved solids continue to be a major problem. The type of ore used is dictated by, and the capacity of the plant is limited by, this parameter.

Emissions

There were no emissions during the month.

A.C.STEINBRONN/kr

cc: D.R.Baker - Bethlehem ✓  
J.F.Smith - Bethlehem  
T.Paige - Bethlehem

11-15-76  
KPA.

**Inter-office  
Correspondence**

**GW** The New Jersey Zinc Company  
A GULF - WESTERN COMPANY



**NJZ**

**To:** F. R. Mohrmann ✓

**At:**

**From:** B. G. O'Connell

**Date:** November 3, 1976

**Subject:** Pollution Monthly Report  
October, 1976

1. Scrubber onstream factor for the month was 91%.  
Installed new titanium impeller during the month and  
also tried steam addition to the prehydrolysis chamber.  
Evaluation is still in progress on the latter.
2. The effluent was within state specifications through-  
out the month.

B. G. O'Connell

BGOC:bw

cc: D.R. Baker - Bethlehem  
J.F. Smith - Bethlehem  
T. Paige - Bethlehem

**Inter-office  
Correspondence**

**GW** The New Jersey Zinc Company  
A DIVISION OF GULF • WESTERN INDUSTRIES, INC.



**NJZ**

To: F. R. Mohrmann

At: Ashtabula, Ohio

From: A. C. Steinbronn

Date: October 1, 1976

Subject: TiCl<sub>4</sub> Unit Pollution Report - September 1976

Air Pollution

The scrubber had a 100% on-stream factor. The east blower, GB-458A, has been in service since July 1.

Water Pollution

There were no violations of the NPDES permit.

Emissions

There were no emissions during the month.

*A.C. Steinbronn*  
A.C. STEINBRONN/kr

cc: T. Paige

D.R. Baker 10-11-76

J.F. Smith

**Inter-office  
Correspondence**

**GW** The New Jersey Zinc Company  
A GULF - WESTERN COMPANY



**NJZ**

To: F. R. Mohrmann ✓

At:

From: B. G. O'Connell

Date: October 8, 1976

Subject:  $\text{TiO}_2$  Pollution Report  
September, 1976

1. The scrubber on-stream factor for the month was 98.7%.  
The blower was down.
2. The effluent was within state specifications during  
the month.

  
Barry G. O'Connell

BGOC:bw

cc: T. Paige  
D.R. Baker  
J.F. Smith

Inter-office  
Correspondence

GW The New Jersey Zinc Company  
A DIVISION OF GULF • WESTERN INDUSTRIES INC.



To: F.R. Mohrmann

At:

From: A.C. Steinbronn

Date: 9-1-76

Subject:  $TiCl_4$  Unit Pollution Report -- August, 1976

AIR POLLUTION:

The scrubber had a 100% on-stream factor. The east blower, GB-458A, has been in service since July 1.

WATER POLLUTION:

There were no violations of the NPDES permit.

EMISSIONS:

There were no emissions during the month.

  
A.C. Steinbronn

ACS:po

cc: T.Paige  
D.Baker ✓  
J.F.Smith

9-10-76  
KAC

Inter-office  
Correspondence



The New Jersey Zinc Company  
A DIVISION OF GULF + WESTERN INDUSTRIES INC



NJZ

To: F. R. Mohrmann

At:

From: B. G. O'Connell

Date: September 8, 1976

Subject:  $\text{TiO}_2$  Pollution Control Report for August, 1976.

1. The scrubber onstream factor for the month was 96%.
2. The water effluent was within state specification during the month.

A handwritten signature in cursive script, appearing to read 'B. G. O'Connell'.

B. G. O'Connell

BGOC:js

cc: T. Paige  
D. Baker  
J. F. Smith

9-10-76

KBE

# Inter-office Correspondence

**GW** The New Jersey Zinc Company  
A DIVISION OF GULF • WESTERN INDUSTRIES, INC.



**NJZ**

To: F. R. Mohrmann

At: Ashtabula, Ohio

From: A. C. Steinbronn

Date: August 6, 1976

Subject: TiCl<sub>4</sub> Unit Pollution Report - July 1976

## Air Pollution

The scrubber had a 100% on-stream factor. The west blower, GB-459B, was taken off-line after 65 days of service due to a bearing failure.

## Water Pollution

There were no violations of the NPDES permit.

## Emissions

There were no emissions during the month.

A.C.STEINBRONN/kr

cc: T.Paige  
D.Baker ✓  
J.F.Smith

8-12-76  
KBA.

AUG 16 1976

**Inter-office  
Correspondence .**

**GW** The New Jersey Zinc Company  
A DIVISION OF GULF • WESTERN INDUSTRIES, INC.



**NJZ**

**To: F. R. Mohrmann**

**At:**

**From: B. G. O'Connell**

**Date: August 10, 1976**

**Subject: Pollution Control Monthly Report  
for July, 1976.**

1. Scrubber onstream factor for the month was 71%. Running hotter temperatures on Cl<sub>2</sub> recovery during the month overloaded the prehydrolysis chamber and resulted in sulfur plating out in the blower thus causing more downtime.
2. Effluent quality for the month was within state specifications.

*B. G. O'Connell*

**B. G. O'Connell**

**BGOC:js**

**cc: T. Paige  
D.R. Baker  
J.F. Smith**

# Inter-office Correspondence

**GW** The New Jersey Zinc Company  
A DIVISION OF GULF • WESTERN INDUSTRIES INC



To: F. R. Mohrmann At: Ashtabula, Ohio

From: A. C. Steinbronn Date: June 28, 1976

Subject: TiCl<sub>4</sub> Unit Pollution Report - June 1976

## Air Pollution

The scrubber had a 100% on-stream factor. Vibration checks showed the following results:

	<u>June</u>	<u>May</u>
Horizontal - average	0.8	0.4
- maximum	3.2	0.5
Vertical - average	0.4	0.1
- maximum	1.9	0.3

## Water Pollution

There was one violation of the NPDES permit, occurring on June 5, 1976. The pH of the effluent was above 9.0 for about 2.5 hours. The high pH was the result of excessive lime addition to the 4th stage of the neutralization system due to a pluggage of the pH pot on this stage.

## Emissions

There were no emissions during the month.

A.C.STEINBRONN/kr

cc: T.Paige  
D.R.Baker  
J.F.Smith

7-14-76  
KRR

JUL 1 8 1976

**Inter-office  
Correspondence**

**GW** The New Jersey Zinc Company  
A DIVISION OF GULF + WESTERN INDUSTRIES, INC.



**NJZ**

To: F. R. Mohrmann

At:

From: B. G. O'Connell

Date: July 2, 1976

Subject: Pollution Control Monthly Report  
for June 1976

1. The scrubber on-stream factor for the month was 90.2%. Blower impeller repairs (sending titanium impeller to Cleveland for welding and balancing) increased the downtime and resulted in a lower on-stream factor. A spare impeller is on order and is expected to be delivered in late July.
2. Water quality was within state specifications throughout the month.

B. G. O'Connell

BGOC:bw

cc: T. Paige  
D.R. Baker  
J.F. Smith

# Inter-office Correspondence

**GW** The New Jersey Zinc Company  
A DIVISION OF GULF + WESTERN INDUSTRIES INC



**NJZ**

To: F. R. Mohrmann

At: Ashtabula, Ohio

From: A. C. Steinbronn

Date: June 3, 1976

Subject: TiCl<sub>4</sub> Unit Pollution Report - May 1976

## Air Pollution

The scrubber had a 100% onstream factor. The east scrubber blower, GB-458 A, was taken off-line due to a bearing failure after 158 days of service. Vibration readings on GB-458 B, immediately after bringing on-line were:

Horizontal	- average	0.4
	- maximum	0.5
Vertical	- average	0.1
	- maximum	0.3

## Water Pollution

There were no violations of the NPDES Permit during either the fiscal or calendar month.

## Emissions

There was an emission on 5/6/76. TiCl<sub>4</sub> was being transferred from one tank to another when one of the tanks pressured up and TiCl<sub>4</sub> was forced up a dip-leg and overflowed.

A.C.STEINBRONN/kr

cc: T.Paige

D.R.Baker

J.F.Smith

6-16-76  
KRM

JUN 18 1976

Inter-office  
Correspondence



The New Jersey Zinc Company  
A DIVISION OF GULF + WESTERN INDUSTRIES INC



To: F. R. Mohrmann

At:

From: B. G. O'Connell

Date: June 9, 1976

Subject: Pollution Control Monthly Report  
for May 1976

1. The scrubber onstream factor was 96.6%, a significant improvement over April's onstream factor of 87%. H<sub>2</sub>O sprays in blower suction and tighter controls on reassembly of blower seemed to be the factor that improved the performance.
2. Water quality was within State specification throughout the month.

A handwritten signature in dark ink, appearing to read 'B. G. O'Connell', written in a cursive style.

B. G. O'Connell

BGOC:bw

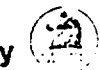
cc: T. Paige  
D.R. Baker  
J.F. Smith

6-16-76  
KAT

Inter-office  
Correspondence



The New Jersey Zinc Company  
A DIVISION OF GULF - WESTERN INDUSTRIES INC.



NJZ

To: F. R. Mohrmann

At:

From: B. G. O'Connell

Date: May 10, 1976

Subject: Pollution Monthly Report, April, 1976

1. Scrubber

The on-stream factor for the month was 87.3%.  
The blower was cleaned 3 times during the month and  
some cracks around the edge of the impeller were welded.

Sprays were added to the suction of the blower  
and in the demister. Evaluation of effect of sprays  
continue. Results to date are promising - the blower  
has been on line over 2 weeks without a shutdown for  
cleaning.

2. Water

The effluent was within state standards during the  
month.

  
B. G. O'Connell

BGOC:bw

cc: T. Paige

D. Baker

J. F. Smith

MAY 17 1976

# Inter-office Correspondence



The New Jersey Zinc Company  
A DIVISION OF GULF + WESTERN INDUSTRIES INC



NJZ

To: F. R. Mohrmann

At: Ashtabula, Ohio

From: A. C. Steinbronn

Date: May 6, 1976

Subject: TiCl<sub>4</sub> Unit Pollution Report - April, 1976

## Air Pollution

The scrubber had a 100% on-stream factor. The scrubber blower has been in service for 154 days. Vibration checks in April showed the following results:

	<u>April</u>	<u>March</u>
Horizontal - average	1.3	0.6
- maximum	2.5	0.8
Vertical - average	0.5	0.3
- maximum	1.5	0.5

## Water Pollution

There were no violations of the NPDES Permit during wither the fiscal or calender month.

The dissolved solids limitation could only be met by higher than budgeted rutile usage.

## Emissions

None.

A.C.STEINBRONN/kr

cc: T.Paige  
D.Baker  
J.F.Smith

**Inter-office  
Correspondence**

**GW** The New Jersey Zinc Company  
A DIVISION OF GULF + WESTERN INDUSTRIES, INC.



**NJZ**

To: F. R. Mohrmann

At:

From: B. G. O'Connell

Date: April 7, 1976

Subject: Pollution Monthly Report, March 1976

1. Waste Disposal

pH control on ponds has proved to be effective in controlling the Fe concentration in effluent to below 2 ppm. Effluent flow meter gave problems most of month. Instituted 1/shift check of flow meter.

2. Scrubber

Testing continues but no significant results to date. Frequent pluggage of blower is the rule. Prehydrolysis nozzles have been changed from PVC to stainless steel in an attempt to lengthen service life of nozzles. Recommendations from RLS and KLY are expected on 4/15.

B. G. O'Connell

BGOC:bw

cc: D. Baker

J.F. Smith

T. Paige

**Inter-office  
Correspondence**

**GW** The New Jersey Zinc Company  
A DIVISION OF GULF + WESTERN INDUSTRIES, INC.



**NJZ**

To: F. R. Mohrmann

At: Ashtabula, Ohio

From: A. C. Steinbronn

Date: April 7, 1976

Subject: TiCl<sub>4</sub> Unit Pollution Report - March 1976

**I. Air Pollution**

The scrubber had a 100% on-stream factor. The scrubber blower has been in service for 130 days. Vibration checks on March 6th showed an average of 0.31 mils, compared with last month's reading of 0.23.

**II. Water Pollution**

There were no violations of the NPDES Permit during the month.

**III. Emissions**

None.

A.C.STEINBRONN/kr

cc: D.Baker ✓  
J.F.Smith  
T.Paige